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KENNETH MASON



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KANGCHENJUNGA

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APRIL, 1930.

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EXPLORATION AND CLIMBING IN THE SIKKIM HIMALAYA.

LIEUT.-COL. H. W. TOBIN.

IN the records of exploration and climbing in the Sikkim Himalaya three names stand pre-eminent. They are those of Sir Joseph Hooker, the great botanist explorer of the middle of last century, Mr. Douglas Freshfield, the distinguished Alpine and Caucasian climber, and the late Dr. A. M. Kellas, who conquered a number of peaks in the eastern Himalaya, and has left a record second to none.

To Hooker we owe a great debt for having opened up Sikkim as an unsurpassed field for both climbers and naturalists, for he spent most of the years 1848 and 1849 among its wonderful mountains and valleys, of which he has left us vivid pictures in his *Himalayan Journals*. Despite political and transportation difficulties, which were far greater eighty years ago than they are now, he blazed trails across Sikkim, which have been followed by his successors of several generations. Starting up the Tambur river in eastern Nepal he visited the Walung and Yangma passes which lead into Tibet a few miles north of Mount Nango.* Passing south of that peak and its unnamed sister, through Kangbachen and down across the Yalung, he crossed the Singalila ridge and visited the Pamionchi, Sangachelling

* No attempt has been made to adopt a uniform or consistent system of transliteration for the names in this paper. The Gazetteer and the Survey of India names require complete revision. A sketch map of Sikkim is at the end of this volume.—ED.

and Tashiding monasteries. In the following January (1849) he ascended the Rathong and reached Dzongri, but snow prevented further progress. In April he went up the Tista to Lachen and made several attempts on Takcham.* From Takcham Hooker made his way up the right bank of the Poki Chu (which he called the Thlonak Chu), bridging it near its junction with the Tumrachen Chu. From there he tried repeatedly to reach the Zemu glacier, but failing to do so, he turned to the Lachen and Lachung valleys, which he explored thoroughly, making unsuccessful attempts on Kangchenjau and the Dongkya peak (Pauhunri). North of the Cholamo lake he ascended Bhomtso and returned to the Lachung valley by the Dongkya La, 18,130 feet.†

While on their way back to Darjeeling, Hooker and his companion, Dr. Campbell, Superintendent of Darjeeling, were seized and detained as prisoners at Tumlong, under the orders of Namgay, the powerful prime minister of Sikkim, and it was only after protracted negotiations that the explorers were released. As retribution for this outrage, the portion of Sikkim south of the Great Rangit, including the Terai from the Mechi to the Tista, now covered by valuable tea-gardens, was annexed by the British Government. This district had been conquered and annexed by the Nepalese, but after the Gurkha war of 1817, it had been restored to the Sikkim Raja, who in the same year ceded to us the hill-station of Darjeeling.

Hooker's small-scale sketch-map of Sikkim remained untouched until Carter, a sapper subaltern, added to it by his reconnaissance survey between Darjeeling and Tumlong, which was executed during the march of Colonel Gawler's force in 1861. The survey of Sikkim was not again resumed until 1878, when Captain H. J. Harman, R.E., of the Survey of India, penetrated several of the outlying valleys. Harman attempted to reach the monastery of Tulung, but he was forced to return from its vicinity by the hostility of the people. He made several journeys in Sikkim, which undermined his health, and in 1881, when attempting to reach the base of Kangchenjunga, he was forced to give up and take sick leave. The survey was continued

* Takcham is the Lepcha name. Hooker spelt it Tukcham. The Survey of India name is Lamgebo; Freshfield calls it Lama Anden.

† I am unable to place or trace Hooker's Bhomtso peak. Perhaps his guide pointed out the Bam Tso, the lake extending from Guru to north-east of Dochen on the Phari-Gyantse road, which might easily be visible from just north of the Cholamo lake. (There is also a small lake called "Bam Tso" about 3 miles north of Cholamo; it seems more likely that Hooker ascended a peak near this point.—Ed.)

under Colonel H. C. B. Tanner, who was, I believe, responsible for the survey training of the three "Pandits," S.C.D., U.G., and R.N. Tanner himself undertook the triangulation, while his assistant, Robert, with the "pandits," carried out and completed the topography.

It was in 1879 that Babu Sarat Chandra Das—well known in the Survey of India records as S.C.D., or "the Babu,"—crossed the Rathong to the Kang La, whence he travelled up the vale of Kangbachen to the Jonsong or Chatang La, and over the Chorten Nima La to Tashi Lhunpo. Again, in 1881, he traversed the Nango La, north of Kangbachen, proceeding thence to Lhasa. In 1883 Lama Ugyen Gyatso, of Pamionchi monastery, a schoolmaster of Darjeeling (U. G., or "the Lama" of the Survey records), travelled by the Tista and Lachung routes and over the Dongkya La, whence he also reached Lhasa, sketching a different route. In the winter of the same year, from October to December, the survey of the accessible parts of Sikkim was completed by Robert and his assistant, Rinzin Namgyal.* Robert reached the northern frontiers of Sikkim and explored the Zemu valley, while Rinzin Namgyal explored the Talung valley and fixed the Tulung monastery. In October 1884 the latter crossed the Kang La into Nepal, explored the Yalung glacier and followed in Sarat Chandra Das' footsteps to the Jonsong La. Thence he descended the "Zemu Chu"—in reality the Lhonak or Langpo Chu—to its junction with the Lachen valley, and returned to Darjeeling on 31st January 1885. Later in the year he traversed the south-east of Sikkim to Bhutan, where he carried out further valuable explorations.†

In 1883 Mr. W. W. Graham made the first big ascents in Sikkim, details of which are given later. Between 1888 and 1896, Major Waddell made several journeys, including one to the Yalung via the Singalila spur. Though he added little to our topographical knowledge, his contributions to the discussion on Graham's claim to have climbed Kabru and his fascinating bits of Sikkim folk-lore

* Rinzin Namgyal, sometimes called in the Survey of India records "the explorer R. N.," is spelt "Rinzin Nimgyal" by Tanner in his report. Both he and Lama Ugyen Gyatso were uncles of Sirdar Laden La, the distinguished police officer and member of the Himalayan Club.

† For details of the survey of Sikkim, see *General Reports of the Survey of India*, 1881-82, 1882-83, 1883-84. For details of the "pandits" explorations see *Explorations in Sikkim, Bhutan and Tibet*, published by the Survey of India in 1889, and also *General Report of the Survey of India*, 1884-85. These have been reprinted in *Records of the Survey of India*, Vol. VIII, part 2.

are of interest. He was accompanied on his travels by the well-known "pandit" Kinthup.

Between 1889 and 1902, the late Mr. Claude White, Political Officer in Sikkim, made some explorations of value, but unfortunately he gives very scant details in his *Sikkim and Bhutan*. During the rainy season of 1890 he crossed the Guicha La and descended the Talung to the Tista. This was the first investigation of the gorges between the Pandim and Simvu groups. Intending to open up the little-known Zemu glacier, White, again during the rainy season, with the German photographer Hoffmann, crossed the Tista at Sanklan Sanpo near Singhik on his way to the Tulung monastery. His route took him up the Ringbi, or Rindiang Chu, and over the Yeumtso La to the Poki Chu, on which he halted a short distance below the snout of the Zemu glacier. He ascended the glacier to about 17,500 feet, but was forced by bad weather to return to the Poki Chu, whence he made his way across the Tangchang La and the The La into Lhonak. There he unfortunately ran into the Dzongpön of Kampa Dzong, who claimed that the The La was the proper frontier of Sikkim and Tibet, and demanded his return. A compromise was agreed upon, whereby White turned eastward across the Lungnak La to Tangu. However, in 1902, when on the Sikkim-Tibet Boundary mission, White was able to go further afield in Lhonak. On this occasion he crossed the Lungnak La in the opposite direction, to the Langpo or Lhonak Chu, and ascended the Chorten Nima La.* It may be of interest to note here that with the exception of the Chorten Nima La, the Naku La, and Kellas' "Sentinel Peak," the range north of Lhonak is still virgin ground.

In 1899 Mr. Douglas Freshfield, accompanied by Professor Garwood, the brothers Sella, and Rinzin Namgyal, made the "high level tour," so ably narrated in *Round Kangchenjunga*. This remains quite the most valuable exploration ever carried out in the Sikkim Himalaya. Leaving Darjeeling on 5th September, they ascended the Poki Chu by its left bank and crossed to the right bank of the Zemu glacier close to its snout. On the 20th they recrossed to the north side and camped a little above 15,000 feet just east of "Green Lake." Freshfield's plans were to ascend the glacier and establish a camp whence he could climb some convenient and accessible peak of about 20,000 or 21,000 feet, from which the practicability of the Nepal

* See also "The Chorten Nima La in Sikkim." *Alpine Journal*, XX, p. 413.

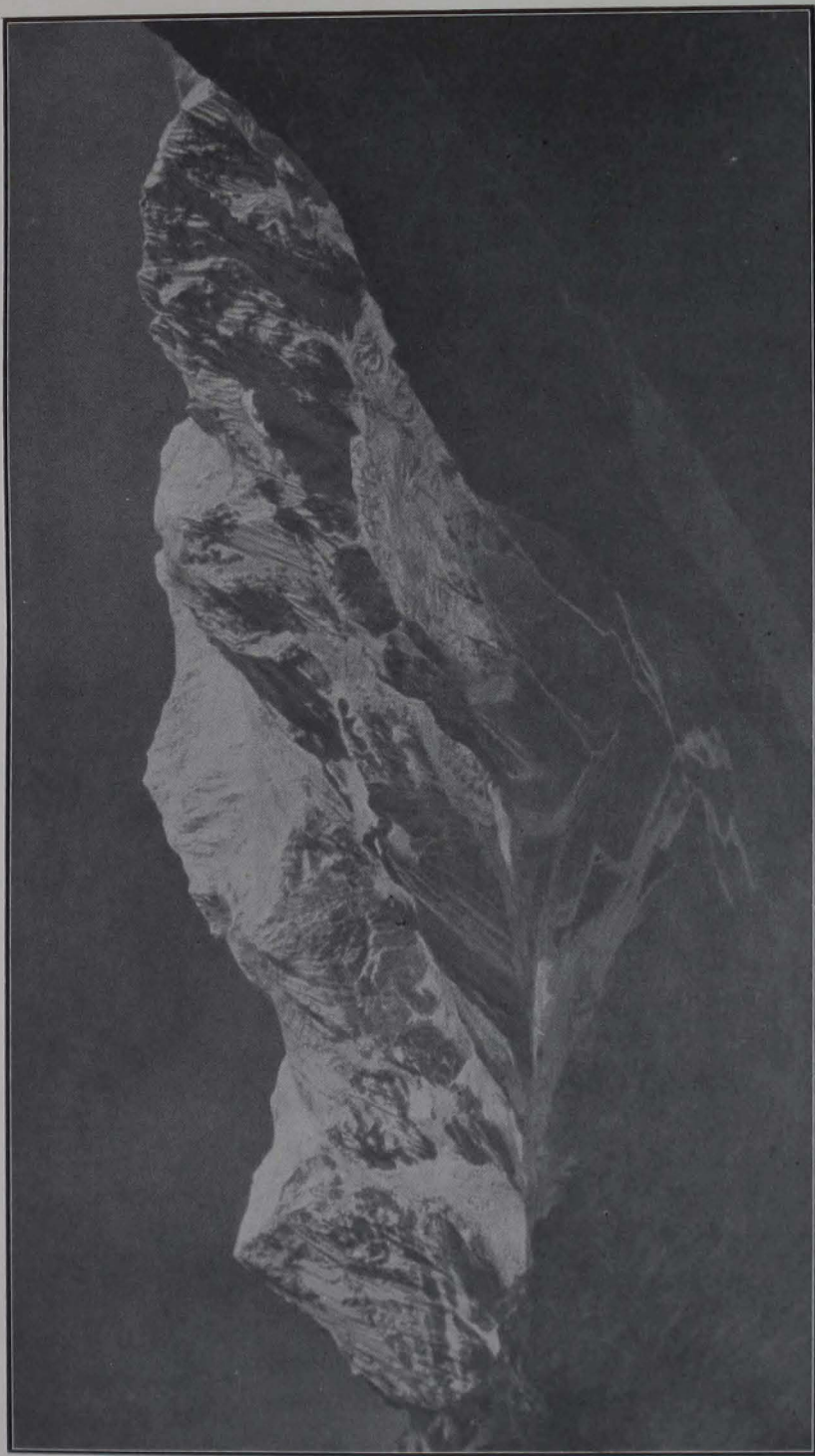


Photo. N. A. Tomblazi.

LITTLE KABRU, KABRU, THE DOME, AND THE FORKED PEAK, FROM KABUR.

gap (21,000 feet) and of the northern approaches to the Zemu gap (19,300 feet) could be determined. Unfortunately abnormal weather set in and a two-days' storm upset his plan of campaign by lowering the snow-level on the mountains by over 4000 feet, i.e., from 18,000 to 14,000 feet. He therefore decided to cross into Lhonak by White's route of 1891 and thence attack the Jonsong La in order to examine the Kangchenjunga group from its northern and western approaches. Leaving the Poki Chu on 28th September they reached Lhonak on 1st October. Most of the party had suffered from the bad weather, and it was with difficulty, owing to new snow, that they crossed the Jonsong La, 20,348 feet, on 6th October.* The descent thence by the Kangchen glacier was arduous for the first three days, but once Pangperma was passed, the going was easy, and the hamlet of Kangbachen was reached on 10th October. In Freshfield's vivid description of the Kangchenjunga group from this side, he makes special reference to the glacier which joins the Kangchen opposite Pangperma. He writes : " It has its origin in a snow plateau, or rather terrace, lying under the highest peak at an elevation of some 27,000 feet, that is, only 1200 feet below the summit : . . . this glacier affords what in my opinion is the only direct route to Kangchenjunga which is not impracticable." Chapter IX of Freshfield's book, from which the above is quoted, deals at some length with this aspect of the mountain and certainly carries conviction.† From Kangbachen the party passed through the small village of Khunza, crossed the Senon La (Chunjerma) and the upper Yalung valley past Tseram, or Ramser, and ascended the Kang La. Proceeding thence to Dzongri, they visited the Guicha La and Alukthang. Garwood's map which accompanies *Round Kangchenjunga* is a very useful and wonderfully accurate production. Freshfield hardly seems to appreciate properly the Sherpa and Bhutia porter, but it must be remembered that he wrote in " pre-Everest " days. His book is an all-essential study for mountaineers in the Sikkim Himalaya.

In 1920 the late Mr. Harold Raeburn carried out two tours south of Kangchenjunga.‡ The objects of the first, in July and August, on which he was accompanied by myself, were the examination of the south-east outliers of Kangchenjunga, the investigation of possible

* See also " The Jonsong La." *Alpine Journal*, XXI, p. 136.

† See also " How to climb Kangchenjunga : a topographical note." *Alpine Journal*, XXII, p. 122.

‡ See *Alpine Journal*, XXXIV, pp. 33—50.

routes up its south-east face,* and the complete traverse of the Talung glacier.† Leaving the usual forest track to Dzongri, some four miles beyond Yoksam, we traversed the western spurs of Jubonu to Alukthang, and the Guicha La was crossed two days later. Descending to the Talung glacier, the Tongshyong glacier was examined with a view to attaining the Zemu gap at its head, but the narrow entrance and the mountain sides were raked by such a continuous hail of rocks and debris that an approach by this route would have been little short of suicidal. The next eight days were spent in forcing the gorges of the Talung, down to the Tista below Singhik.

Immediately after his return from the Talung glacier, Raeburn, with Mr. C. G. Crawford as companion, set out via the Singalila ridge for the Yalung glacier, only once before visited, by Guillardmod's ill-fated party in 1905 (*see below*). From Gamothang and Bogta they crossed the Semo La to the Kangra Lama, which they followed to its junction with the Yalung below Tseram. Working their way up the Yalung glacier, they established on 26th September a camp at 16,500 feet, just south of a great spur which runs westward from the Talung peak. From 19,000 feet on this spur they examined the south-west face of Kangchenjunga and the Talung saddle, both of which looked unpromising. Further reconnaissance took them across a branch of a glacier flowing westward from the Talung saddle and up to a camp at 20,000 feet, below the great snow-slope which has at its upper end the sickle-shaped rock, so distinctly to be seen from Darjeeling. On 1st October they ascended another thousand feet, but realized that their resources in skilled climbers, porters and food were inadequate for further serious attempts. From here, says Raeburn, "the Talung saddle looked vicious in the extreme, defended everywhere by overhanging masses of ice." They found that steep rock at 21,000 feet was a good deal less exhausting to climb than hard steep snow. Descending to upper Tseram they then set out on a preconceived project of finding a direct route from the Yalung to the Rathong. Starting at 3-30 in the morning, they were by dawn on the high central moraine of a glacier flowing north-west from the Rathong pass, just south of Little Kabru. The route proved less difficult than expected, and before noon they reached the top of the pass. On the descent to the Rathong, they passed the foot of the great Kabru glacier, which Rubenson and Monrad Aas had ascended in 1908, and which Raeburn

* The south-east face is shown in the *frontispiece*.

† *Talung*=Rock-avalanche.



Photo. N. A. Tombazi.

THE FORKED PEAK FROM KABUR GAP.

described as "really almost one stupendous ice-fall and nearly 8000 feet high." Soft snow made the going arduous, but by dusk they had reached grass. Next morning they crossed a col of some 14,500 feet, below and south-west of Kabur, and on the third day from Tseram they arrived at Pamionchi a few hours ahead of their porters who had gone via the Chunbab La.*

In 1925 Mr. N. A. Tombazi made a very successful photographic expedition to the southern glaciers of the Kangchenjunga group. He attained 20,000 feet on the Dome Peak from the Alukthang glacier, and also made the first ascent of the Zemu gap from the south, via the Talung and Tongshyong glaciers. This, it was hoped, would prove an easier route to the Zemu glacier than that via Lachen, but it was found quite unsuitable for loaded porters.†

In May 1926 Captain Boustead followed much the same route as Tombazi to the Zemu gap. He rightly lays stress on the peculiar risks attending those venturing over the Guicha La on to the Talung and Tongshyong glaciers. From the eastern face of the Talung saddle, from the north-east shoulder of Pandim, and from the eastern ridges of Kangchenjunga avalanches fall with frequency. The thick mists which gather about Zemu (or Cloud) gap and the Guicha La envelop the spurs and fill the gorges, often rendering it impossible for the explorer to locate himself and to realize when he is in peril. Raeburn's experience here in 1920 was similar and showed that the earliest possible start is imperative in this area, before the rocks have been loosened by thaw. With such a start Boustead estimates that the Zemu gap could be crossed from the Talung in about four and a half hours. Boustead also reconnoitred Pandim from the north, ascending a very steep couloir, but was stopped at 20,000 feet by a precipitous ice-fall. An attack up the spur running north-west down to the Guicha La was foiled by foul weather, the monsoon breaking early.‡

Though definite distinction between exploration and climbing is hardly practicable, the foregoing summaries have been grouped together as being rather of the former category than of the latter. The following paragraphs are an attempt to epitomize the comparatively few ascents of and attacks on peaks of 20,000 feet and over in the Sikkim Himalaya.

* See *Alpine Journal*, XXXIV, p. 33.

† See *Alpine Journal*, XXXVIII, p. 150; *Geographical Journal*, LXVII.

‡ See *Geographical Journal*, LXIX, pp. 344—350.

The first climber of note in these parts was Mr. W. W. Graham,* whose claim to have climbed Kabru in October 1883 has been the subject of much controversy. His climbs in the Sikkim Himalaya were briefly as follows. On 1st October, with two Swiss guides, Boss and Kaufmann, he ascended "Jubrun" (= Jubonu) in the Pandim group. This mountain Graham estimated at 21,400 feet, but it has since been triangulated at 19,530 feet. He pronounced Pandim to be "quite inaccessible owing to hanging glaciers," he having been "all round the base of the ice-wall, seeking for a crack and finding none." With his guides he camped on 5th October at 18,500 feet on the south-eastern arête, "the only possible one" of Kabru.

Next morning they crossed a dangerous couloir to a steep ice-slope, which led to another snow incline and so to the foot of the eastern peak. Above this snow incline they had a thousand feet of "most delightful rock work," which was accomplished five and a half hours after the morning's start. "Not more than 1500 feet above this was the eastern summit" to which led a slope of pure ice standing from 45 to 60 degrees. On the ice lay three or four inches of frozen snow, and up it they cut their way to the top, "at least 23,700 feet above the sea."† The eastern was connected with the western and higher summit by a short arête from which the latter rose for three hundred feet of extremely steep ice. This summit, but for one ice-gendarme some thirty feet high, was conquered in another hour and a half, and the descent commenced about three o'clock. This proved more difficult, but with the help of a brilliant moon camp was reached by ten.

Such authorities as Conway, Tanner, Freshfield, Collie, Workman, Garwood, Waddell and Raeburn have argued for or against the validity of the claim, the point of those against it being generally that Graham was entirely mistaken as to his actual location. Raeburn suggests that the peak climbed was probably the "Forked Peak." It need only be remarked here that most of the controversy took place prior to the attempt of Rubenson and Monrad Aas, which was twenty-four years after Graham's attack.

In August 1905 Dr. Guillardod, M. Reymond, M. Pache, M. de Righi and Mr. Crowley proceeded via the Singalila ridge to the Yalung glacier. From the head of the glacier they tackled the ice-slopes below the south-west cliffs of the main peak of Kangchenjunga, and

* See *Alpine Journal*, XI, pp. 402—407; XII, pp. 25—52.

† The latest value for the height of Kabru is 24,002 feet.—ED.

on 1st September established a camp at 20,500 feet. That afternoon Guillardmod, Pache and de Righi with three porters started to descend to a lower camp. While traversing a snow-slope the two middle porters slipped and the whole party was dragged down, Pache and three porters being buried. Raymond came down alone from the upper camp on hearing shouts, and assisted in attempts at rescue, but the bodies were only recovered three days later, buried under ten feet of snow. The expedition was naturally broken up.*

In October 1907 two Norwegians, Mr. C. W. Rubenson and Mr. Monrad Aas, made a gallant attempt on Kabru. Starting from the Rathong glen on 6th October and skirting the "Dome Peak" by the south and west they established their first high camp at 19,500 feet near the lower end of the ice-fall of the Kabru glacier. From this they cut their way for five days "between a chaos of ice-needles and crevasses." Half-way up this ice-fall they halted for two days and thereafter found the route slightly less difficult, though enormous crevasses had to be crossed. At about 21,500 feet they formed a camp on the lower part of the big "snow flat," seen from Darjeeling between the two peaks, and from here tackled the eastern summit. At the first attempt they started the climb too late and had to return to camp. On 19th October they took their camp to 22,000 feet and on the 20th made their second assault, but owing to the intense cold they again could not get started until eight-thirty. By 6 p.m. they were at about 23,900 feet with only one short snow-slope between them and victory. The cold was almost unbearable and the wind nearly swept them off their feet. They had discarded their nailed boots at their 22,000-foot camp, as the nails conducted the cold to their feet. There was to be an early moon but the late hour made a descent imperative. On their way down they had a very narrow escape, Rubenson, who was behind, slipping in his unnailed boots and shooting down past his companion. Monrad Aas was luckily able to check his fall, but four out of the five strands of the Swiss tourist rope parted. When they reached camp it was found that six of Monrad Aas' toes were badly frost-bitten. They were most unfortunate in failing to conquer Kabru, but the experience gained was most valuable. They spent twelve days at above 20,000 feet without apparent physical deterioration, despite shortage of proper food, and proved the possibility of climbing much higher peaks than Kabru. In this connection it is interesting to note that according to Monrad Aas, Rubenson had never climbed a mountain previous to the Kabru expedition. Another source of satisfaction

* See "The Disaster on Kangchenjunga." *Alpine Journal*, XXIII, p. 51.

was the capability and reliability of the Sherpa porter, especially when properly equipped and well treated.*

Pre-eminent in Himalayan records stands the name of that indefatigable but extremely modest and reticent climber, the late Dr. A. M. Kellas, who lies in a lonely grave at Kampa Dzong. It is perhaps more convenient to chronicle his many fine achievements by locality rather than by date.†

North-east Sikkim.

Chomiomo, 22,430 feet. In July 1910 after trying several approaches, he ascended to the summit from the north-west.

Dongkya Peak, or *Pauhunri*, 23,180 feet. At his first attempt in August 1909, with only two coolies, he was driven back by snow and storm from 21,700 feet. In October 1909 he tried again, reaching 23,000 feet, but was forced by deep snow and high wind to retreat after sunset. His third attempt, from 13th to 17th June, 1910, was successful.

Kangchenjau or *Kangchima*, 22,700 feet. Kellas, in August 1912, took a route from his 19,200-foot camp on the north side of the mountain up a steep *névé* and ice-slope, which led to a col lying north of the *Sebu La* at 21,000 feet. Reaching this col in two hours, he turned west on steep snow at 45 to 60 degrees, climbing another thousand feet to a belt of rocks. Skirting the north side of these rocks, by which he was protected from the prevailing south wind, he attained the summit plateau some seven hours after starting to climb, the last seven hundred feet being up soft snow. The summit plateau is about two miles from east to west and a few hundred yards across. Mist prevented him from investigating the western summit, but he suggested a better and comparatively easy route to it, via the north-eastern *Kangchenjau* glacier. By working up this glacier south-westward, the south side of the col referred to above might be reached, and thence the west peak should present little difficulty. This route was tried by *Tombazi* at the end of July 1919, but he was driven back from 20,000 feet by a heavy snow-storm.

In this part of Sikkim Kellas also crossed the *Sebu La*, 17,600 feet, which leads from the *Lachen* to the *Lachung*, near *Mome Samdong*. It is believed that this was the first crossing by a European.

* See *Alpine Journal*, XXIV, pp. 63—67; pp. 310—321.

† Brief summaries of Dr. Kellas' climbs are given in *Alpine Journals*, XXVI, p. 52, 113; XXVII, p. 125; XXXIV, p. 408.



Photo. N. A. Tombazi.

PANDIM FROM THE SOUTH.

About the Zemu Glacier.

Simvu, 22,360 feet. In September 1907 Kellas made three attempts with European guides but failed owing to fresh snow and foul weather to reach the summit.

Simvu Saddle, 17,700 feet and *Zemu Gap*, 19,300 feet. He ascended from the Zemu glacier in May 1910.

Nepal Gap, 21,000 feet. Two attempts in 1907 failed, the first at 18,000 feet owing to mist, the second at 19,000 feet owing to crevasses. A third attempt in September 1909 was defeated at 20,000 feet by a heavy snow-storm. At his fourth attempt in May 1910 he reached approximately 21,000 feet, but did not scale a small rock wall at the summit.

Tent Peak, 24,089 feet. In May 1910 Kellas ascended the ice-fall to the south and crossed the "Lhonak La," 19,500 feet, which leads to Lhonak, but which he pronounced too difficult and dangerous for loaded porters.

About the Jonsong La.

In early September 1909 Kellas visited the Langpo and Kangchenjunga glaciers.

Langpo Peak, 22,800 feet. He ascended this from the west, on the 13th and 14th September. In May 1910, he ascended it to 22,500 feet in order to examine the summit ridge of Jonsong peak.

Jongsong Peak, 24,340 feet. From the end of the Lhonak glacier, in September 1909, he ascended to 22,000 feet on the west ridge of Jonsong, but owing to thick mist and storm, he was obliged to descend to the glacier near the Chorten Nima La.

"*Sentinel Peak*," 21,240 feet (or 21,700 feet), east of the Chorten Nima La. Kellas ascended this peak in May 1910.

In 1920 Kellas was back again in Sikkim and during the autumn conquered *Narsingh*, 19,130 feet. It is believed that he also reached the summit of *Lama Anden* (or *Lamgebo*), 19,250 feet, about the same time. The following spring he worked out a new route on the ice-fall of Kabru, intending to use it later. Here he reached 21,000 feet. He returned from Sikkim to Darjeeling only a few days before starting on the first expedition to Mount Everest, but died on his way through Tibet with the party. His expedition in 1907 appears to have been the only one on which he was accompanied by Europeans while climbing. Though he wrote some valuable papers on the physiological and physical aspects of climbing, accounts of his actual ascents are unfortunately few and scanty.

The German Kangchenjunga Expedition of August to October 1929 is described later in this volume. But as this article would be incomplete without mention of their achievements, it may be said that from the Zemu glacier they made a most gallant and determined attack on the summit of Kangchenjunga by its eastern spur, or rather buttress, attaining in their final effort an altitude of approximately 24,400 feet. All their technical climbing difficulties were behind them and victory appeared to be almost within their grasp, when the weather broke and forced a descent, which was attended with great difficulties.

Though Sikkim is reasonably accessible, only some half-dozen of its countless lofty peaks have been conquered, and many of its fascinating valleys and uplands have scarcely been trodden by Europeans. There is therefore plenty of scope for explorers and naturalists as well as for climbers. Here, more than anywhere else, weather is the deciding factor in climbing, for again and again we see that snow or storm have forced a retreat when, under more favourable conditions, the final effort would have been crowned with victory. Nevertheless he is a bold man who, reading of these determined assaults, sometimes successful, sometimes splendid failures, will pronounce the summit of any peak in the Sikkim Himalaya to be definitely inaccessible.

Postscript. In compiling the foregoing brief summary of exploration and climbing in and near Sikkim, I have been greatly helped by Mr. N. A. Tombazi, who has not only advised me, having special and intimate knowledge of the subject, but has also supplied me with extracts from certain Geographical and Alpine Journals; he has also provided several fine photographs to illustrate the article. I have also to thank the Editor for much valuable assistance and advice.

The following works have been consulted :

Himalayan Journals, by Sir Joseph Hooker.

Among the Himalayas, by Major L. A. Waddell.

Sikkim and Bhutan, by Claude White.

Round Kangchenjunga, by Douglas Freshfield.

Gazetteer of Sikkim, edited by H. H. Risley, for the Bengal Secretariat, 1894.

Geographical Journals, *Alpine Journals*, and *Records and General Reports of the Survey of India*.

THE GERMAN ATTACK ON KANGCHENJUNGA, 1929.

PAUL BAUER.*

FOR several years every Saturday we set out from Munich for the mountains; for many years we devoted all our vacations and holidays to mountaineering in order to prepare ourselves for greater endeavours. We did not know then of this great undertaking, but we believed in it. Our experiences in 1928 on the Pamirs, in South America and in the Caucasus, showed us that we were now ready for our greatest attempt. In January 1929 I resolved to visit the Himalaya. With friends, whom I approached to take part in the expedition, and with Sections, who were willingly prepared for sacrifices, my plan was received enthusiastically. Four months of very hard work were necessary to prepare everything to the minutest detail. The end of June found us sailing with all our equipment through the Mediterranean on our way to India.

There were nine of us : Dr. Eugen Allwein (Pamirs, 1928), Peter Aufschnaiter, Paul Bauer (Caucasus, 1928), Dr. Ernst Beigel (Caucasus, 1928), Julius Brenner, Wilhelm Fendt, Karl von Kraus, Joachim Leupold and Alexander Thoenes, all members of the *Akademischen Alpenverein Munich* and of the German and Austrian Alpine Club, principally of the *Hochland* and *Oberland* Sections. Three-eighths of the necessary expenses were contributed by the members, the remainder by the Committees of the above-mentioned clubs. Our objective was not yet definitely settled. If difficulties should be placed on a journey through Sikkim, we were prepared to choose the Central Himalaya as our goal. Whether we should attempt an 8000-metre mountain, such as Kangchenjunga, or train ourselves on mountains 7000 metres high, only experience on the spot would show.

At the end of July we arrived at Darjeeling. Sikkim was open to us, Nepal for the present was closed. We therefore fixed on the Zemu glacier as our first objective. Whether we would then tackle

* I am indebted to Dr. O. Eberl, the German Vice-Consul at Calcutta, for the translation of Herr Bauer's article, which arrived just before going to press. There has not been time to illustrate it with photographs or a special map. The map at the end shows the North-east Spur.—ED.

Kangchenjunga itself we did not know, though our scruples against an immediate attack of this tremendous mountain were lessened by the Indian Press calling us from the very beginning the "Kangchenjunga Expedition." Profiting from our own experiences and from those of the Mt. Everest expeditions, we had prepared in Germany all our loads to be suitable for porters. Owing to the perfect arrangements and to the strong support of the officials in Darjeeling and of the Himalayan Club we were able to leave that place three days after our arrival. We had supplemented our provisions and hired ninety native porters, (of whom fifteen had already been on expeditions to Mt. Everest), two sirdars, two cooks, one interpreter and some under-sirdars. In the first week of August we set out in two columns, northwards through Sikkim, with an interval of two days between each. I personally travelled with the second column with Lt.-Col. H. W. Tobin, the local secretary of the Himalayan Club, who to our great satisfaction accompanied us. In Gangtok I bought provisions for the porters and the following day rode to Tsuntang in order to catch up the first column.

On the 9th August, an hour's march north of Lachen, an exploring party left the mule-track to Tibet and penetrated into the thick jungle of the Zemu valley. It made good progress and was followed during the next few days by the other columns. Leaving Camp I (near Yaktang, 3360 m.) and Camp II (at the commencement of the glacier, 3840 m.) we reached—all the time remaining on the north side of the valley—Camp III ($3\frac{1}{2}$ hours east of Freshfield's Green Lake, 4370 m.). Here we established the Base Camp and on the 18th commenced our exploration. It now had to be seen whether we could tackle Kangchenjunga from this side and whether we could do so immediately. Brenner and I started at once with one porter, Tobin accompanying us for one day. Aufschnaiter, Kraus and Leupold marched towards Simvu in order to obtain from there a view into the structure of Kangchenjunga.

After three days Brenner and I stood at the foot of the mountain and looked up to the North-east Spur, which according to a telephoto in Freshfield's book, seemed to offer a possibility of ascent. The sight was terrible. We turned silently back in order to penetrate the glacier valley between Kangchenjunga and the Twins. If, there at the back, we could gain the col between Kangchenjunga and the Twins, the key was found. In the afternoon, however, we decided that this was quite impossible. A thousand metres of the steepest ice-wall with overhanging cliffs is no ground over which to lead up

laden porters. From here, however, the ascent of the North-east Spur seemed more feasible. On the 22nd we arrived at the same time as the Simvu party back at the Base Camp. I was convinced that the Spur was worth a trial, that it was attainable, and that we should attack it at once. The Simvu party had experienced bad weather most of the time; thrice they had attempted the Simvu saddle, but danger from avalanches had prevented further progress. They had had sufficient view to establish the fact that the Simvu massif is in reality quite different from what it appears on maps and that one cannot reach the main peak directly from the saddle.

In the Base Camp detailed arrangements were made during the next few days as the result of our reconnaissance, and the porters were suitably equipped. Tobin returned *via* the Yumtso La to Tulung-Gangtok-Darjeeling. Fendt and Brenner started on an exploration of the north cleft. They intended also to explore the Upper Tumrach valley, and reached the top which presumably dominates the end of the valley, but mist prevented any further view.

On the 26th, we started the advance towards Kangchenjunga. Two days later the first party (Kraus, Leupold and myself with six porters) established Camp VI at the foot of the mountain at the height of 5200 m. By the time the second party arrived we had already discovered a way through the bergschrund above the camp, and established a new camp at the foot of the steep pitch which led up to the North-east Spur. The next few days were occupied in attempts to reach the arête. On the 2nd September Kraus and I were within a hundred metres of its crest, but the next day a party comprising Allwein, Aufschnaiter, Thoenes and myself, with three porters laden with provisions and equipment, got into difficulties a few metres above the place we had turned back from the day before. Aufschnaiter and I at once returned with the coolies as the position was too dangerous. Allwein and Thoenes however, attempted to reach the ridge, unencumbered; they also were forced to return scarcely two rope-lengths away from the crest. It was now doubtful whether we should reach the arête, so the following day I sent a message to Camp VI, telling the men there to explore the ascent from the Zemu Gap. We made one more attempt to reach the arête the next day and Allwein and Thoenes succeeded by a very dangerous couloir. To go further however seemed quite impossible.

Then from the Zemu Gap we received bad reports from Kraus and Leopold—much snow and great danger of avalanches. I still

believed in the ascent of the Spur and did not wish to yield without one more supreme effort. On the 6th, we made our last decisive attempt and for the third time we stood on the same spot. On this day we found the key ; it lay in an absolutely new ice-technique by which ice-formations never seen before were made passable even for porters. The Spur therefore was conquered. Then a violent blizzard forced us to return ; we even had to retire right down to Camp VI the next day. The 8th September was the only day throughout the whole expedition on which all members were together. On the 9th, Camp VII was reoccupied under special weather conditions, but heavy snow fell again and avalanches came down near the camp, so that we had to vacate it hurriedly. Both parties from Camp VII and Camp VI had to work strenuously a whole day in snow a metre and a half deep before space could be found for all of us in Camp VI, while a further day was spent re-establishing communications with Camp III.

We were now ready to start the real assault. This we intended to make from the North-east Spur and from the Zemu Gap simultaneously. Camp VII was shifted to a place safe from avalanches at a height of 5700 m. On the 16th Beigel, Kraus and I reached the much-fought-for ridge after several days of hard step-cutting. For two more days we worked on the ice-pinnacles of the arête, and on the 19th, stood directly before the place where the final ascent starts. After a day's rest we intended to move the camp higher to the first broad place on the incline and Aufschnaiter, Beigel, Kraus and myself with three porters made good progress on the 20th, but we only managed about 150 metres, Beigel and I camping at a very exposed spot ; the place for the little tent we carried had to be hacked out of the rock. The next day Beigel and I cut a very precarious path across the other pinnacles. We hacked our way under and through the snow mounds, enlarging holes and cutting paths in the sides of the steep ice-walls. The many and varied ice-formations helped us a great deal. We reached and prepared the projected camp-site, Allwein, Kraus and Thoenes with two porters moving into it the same day (Camp VIII, 6300 m.). The Zemu party who, owing to the dangers of avalanches, had been unable to go beyond the Zemu Gap, had been broken up. Here at the Spur the difficulties were so great as to tax our whole strength.

On the 23rd, I descended to Camp VI to meet Mr. Shebbeare who had arrived from Darjeeling. Daily convoys organized by Brenner and Fendt came and went between Camps III and VII. At Camp

III was Leupold, who organized with the greatest care and thoroughness the convoys from Gangtok to Camp VI. Shebbeare returned on the 24th to Darjeeling.

When we—Brenner, Fendt and I, with three porters—returned on the 26th to Camp VIII, the last 60-metre gendarme, which up to now had still stood in menacing uncertainty, had been conquered. Allwein, Beigel, Kraus and Thoenes had alternatively worked at it. It had taken them two days alone to cut a vertical 8-metre tunnel through an insignificant but almost unsurmountable ice-pinnacle. Beyond this great fissure we established Camp IX (6600 m.). The most difficult work had been accomplished. The ridge offered no further insuperable obstacles ; the subsequent peaks would not stop us for long. Provisions were now replenished, and on the 2nd October the first advance party consisting of Allwein, Aufschnaiter, Kraus and Thoenes with two porters moved into Camp X, (7100 m.), on the broad exposed ridge. Beigel and I followed the next day with two more porters. It was on that day that Allwein and Kraus, without knowing it, reached the highest point. Whilst Thoenes dug an ice-cave—we had at Camp VIII, IX, and X roomy caves to hold six or eight men with a small entrance cut out of the ice, warm and affording protection from the wind—the rest explored the way upwards in order to leave at the same time a trail for the next day. At 11 o'clock, at a height of 7400 m. they turned back, as the first peak about 8000 m. high could not be reached on that day if they were to return to camp by 5 o'clock.*

On the evening of the 3rd six of us and four porters with full equipment and provisions stood ready in Camp X (7100 m.) to start the ascent of the 8000 m. regions. Things however turned out differently. During the night there was a heavy snow-storm which lasted through the 4th. As it was evident that an attack would be delayed, the upper camp had to be reduced, if provisions were to last ; more supplies had also to be brought up for the advance. Kraus and

* At 5-30 P.M. the ridge is already in darkness and half an hour later the thermometer already shows 12-16° below zero. It would have been useless to cut a track in advance for the next day owing to the high wind. The heights mentioned were measured with aneroids which were continually compared with the hypsometers erected in Camps III and VI. The figure for the highest point reached is believed to be rather too low than too high, as the aneroids are slow in rising.

Thoenes went down with the porters, Lewa and Sitten,* to help the parties of Brenner and Fendt. On the 5th it continued to snow heavily and uninterruptedly. Kangchenjunga became practically impossible. Beigel and Aufschnaiter broke camp on the 6th, and, as the weather had improved, Allwein and I decided with the porters Keddar and Pasang to move the camp higher up. It was a hopeless task. In two hours we only gained 80 metres. We stood with the snow half up to our thighs. The crust was extremely thin and breakable. Leaving our rucksacks behind we persevered for another hour and a half. The view was overwhelming. Even our porters stared in amazement with shining eyes. Then at last we turned back. We had to wait till crust got a little harder. In the evening it snowed again, and by 7 o'clock the snowfall was very heavy. Within 24 hours we had had at least two metres of fresh snow. This was the grave of all our plans. Whilst yesterday we still thought of advancing, to-day it required good nerves to consider even the possibility of returning.

At a rope's length of 40 metres between each man, Allwein tracked ahead with heavy snow-topped boots, the porters in the centre, and I at the end. This is how we began on the 8th October to cut our way back through blizzards and high winds. We marched through a lane of snow the height of a man. The porters with their heavy loads—they carried 80 lbs. and we only 30-40 lbs.—continually stuck helplessly and had to be pulled out. A very slight incline fifty metres long caused two hours of hard work. At the first avalanche-track, the avalanche descended as expected when Allwein climbed on to it;† at the next spot, the avalanches had already fallen. Further on at another place

* It is only fair to the Tibetan porter to remark that on this expedition he had little chance of showing his fine qualities. Two of the best of the Bhutias, Lobsang and Sonam Tobgay, had only returned two months earlier from Farmer's ill-fated expedition, on which they had suffered severely, and these two creaked up at the end of the first month. Another, Namgyal, who had been severely frost-bitten on Everest, also fell out early. It was no doubt largely on account of these failures that Sherpas were entirely selected for the high work, while to the Bhutia was allotted the arduous but less spectacular task of humping the stores up the glacier, where there was little room for initiative. The experience of other expeditions employing a mixed force of Sherpas and Bhutias has been that there is little to choose between these two splendid races, either in courage or endurance.—H. W. T.

† Herr Bauer explained to me that they learned the tracks and habits of the avalanches which occurred with the utmost regularity. At certain spots they could exactly foretell when an avalanche would occur.—ED.

an avalanche did not break until the first three had got on to it. The long rope brought salvation. The ice-cave of Camp VII was deeply buried under snow. The next day we had to return, as it was impossible to cross the fissures with the heavy loads. Already on the previous day several mishaps had made the porters nervous. We returned to our ice cave and tried to make the largest fissure passable, unencumbered. On the 10th, we cast half our loads, packed in two great bags, over the cliff down to the glacier 1500 m. below us. Being so much lighter we could now risk the descent. For two full days we worked down to Camp VII anxious and uncertain of the fate of the others.

Here at last we received reassuring news. Kraus, Thoenes and the two porters had arrived safely. Aufschnaiter and Beigel had been on their way since the 7th from Camp X to Camp VII under very severe weather. At the fall of darkness they had reached the horizontal stretch of the arête at 6000 metres, beyond which point they could advance no further. Avalanches had carried away their rucksacks, and they had to pass the night here without provisions or protection of any sort. The next day they cut their way down to Camp VII, Beigel with his toes frost-bitten. All communication between the different camps was broken. In Camps VIII, VI and III there were our men, surrounded by snow walls nearly two metres high, anxiously waiting for news about the fate of the men higher up. Porters, attempting to reach Camp VI from Camp III, had not covered a third of the distance after three days and were forced to turn back. From Camp VII we reached Camp VI in one day because from the lower camp half the way had already been re-cut. With the few porters remaining at our disposal we cleared the whole camp. The men behaved wonderfully although they had been through very severe experiences. With the porters carrying 60 kilos and ourselves 60 lbs., we left Camp VI. Half-way down we met relief caravans sent up to meet us. In beautiful weather we made our way through the glistening snow to Camp III, and relieved Leupold of his anxiety about our fate and his loneliness. He immediately left for Lachen to bring up more porters and to arrange a stretcher for Beigel.

At the mouth of the glacier we again had bad weather. For three days it snowed and rained uninterruptedly.* The snow-covered

* These three days in the middle of October saw the fiercest storms in Sikkim for the whole year. Lower down the roads and railways were destroyed in a number of places, and many parties were held up. Great anxiety was felt for the members of the German Expedition.—ED.

bamboos and rhododendrons made the passage most difficult. Here Beigel could not be carried and had to walk. Avalanches crashed through the jungle and thundered over precipices. Knee-deep snow-water pools covered the ground in the jungle for hours. Mountains were rent by landslips. On the 20th October at about 2 o'clock the last two of the expedition arrived in Lachen, whilst the landslips falling from high up on Lamgebo, in front of them and behind, crashed over the trembling precipices into the ravines. A week later we arrived in Darjeeling and Beigel immediately left for Calcutta.

Kangchenjunga, which for many decades has on every clear day been admired by thousands who believe in the impossibility of climbing it, had become more than ever the centre of interest.

THE GEM-STONES OF THE HIMALAYA.

DR. A. M. HERON.

THE Himalayan region is strikingly poor in minerals of economic value. As the valleys and the lower ranges are well-populated and constantly traversed by keen-eyed hillmen herding stock or on shikar, there is little likelihood that important deposits of well-known or conspicuous minerals can have escaped notice in the more frequented tracts. It is otherwise, however, in the case of rarer minerals, the uses of which are unknown to the people, and in the remote and untravelled wilderness near the realm of snow, where much may still be undiscovered.

Precious and semi-precious gem-stones are, from their beautiful colours, the most conspicuous of minerals, and the ease with which they are collected and transported enhances their lure in the eyes of the amateur prospector. I have therefore put together some particulars of the known occurrences in the Himalaya, as an indication of what may be found.

The majority of gems, other than diamonds, into the origin of which we need not enter, are found in pegmatites, crystalline marbles, and gneisses. These rocks are found in the Great Himalaya range from end to end, and anywhere within this vast belt gems may occur ; but they are special chemical compounds produced in the earth's laboratory by unusual combinations of circumstances, about which we know little. In consequence, although the parent rocks are common, the species of mineral to which precious stones belong occur sparsely and erratically ; and still rarer are those clear and well-crystallized specimens from which alone gems can be cut.

Gneisses are grey rocks consisting mainly of quartz, felspar and mica, and are characterized by a streaky or banded texture. They are the result of the intense heating, compression, shearing and re-crystallization of either sedimentary rocks, such as shales, or igneous rocks of the granite type. Most gneissic complexes probably comprise both, i.e., very highly altered shales, intimately injected with granite veins. Marbles, or coarsely crystalline limestones, similarly result from the heating of ordinary limestones, whereby the finely divided calcium carbonate of the original rock is re-crystallized in a coarse

sugary texture, and the impurities separate out as crystalline oxides and silicates. Gneisses and marbles often compose the deeply-folded and crushed cores of mountain ranges, as well as vast areas of the more ancient rocks. In mineral composition pegmatite is akin to granite, consisting in the main of quartz and felspar, but is coarser in crystalline grain, and carries a greater variety of accessory minerals. It usually occurs in white veins ramifying through other rocks, into which it has been injected in a molten state. Pegmatite is supposed to have been the residual liquid remaining after the principal mineral constituents, quartz, felspar and mica, have crystallized from deep-seated masses of molten granite, and, as these masses contracted on cooling, has been squeezed out from them into the surrounding rocks, carrying with it much of the unusual ingredients of the granite. On the slow cooling of this complex molten mixture in veins, it solidifies, by the separation of its component minerals, as more or less perfect crystals.

The best place to search for gems is not in their matrix, but amongst the gravels, moraine and scree, which collect below slopes where such rocks crop out, and in the beds of streams draining them. Under the action of frost, rain and sun, the rocks slowly disintegrate, and in time are washed away as sand and mud, while the gems, being in their nature almost indestructible, tend to remain near their place of origin. A natural concentration thus takes place and the searcher has a far better chance of finding them in such situations than where they are sparsely scattered through the matrix, from which they can be extracted unbroken only with difficulty.

Sapphires were first brought into Simla early in 1882, by traders from Lahul, who stated that a landslip had laid bare the rocks beneath the soil, thus disclosing the presence of the gems. Until guards were posted over the locality by the Maharajah of Kashmir, large quantities of the stones were brought to Simla, and sold at absurdly low prices, such as a rupee a seer. Originally they were stated to have come from the village of Pādam in Zaskar, owing to confusion with the true locality, which is the district of Pādar in the Chenab valley (Kishtwar). The mines are in a small upland valley below the Umasi La* on the Great Himalaya range, at an altitude of 14,000 feet above

* Modern surveys (map 52 C/sw) extend up the Bhutna as far as the police post only, which is two miles short of Sumsam. The village itself is shown on the map compiled from old surveys, 52 C, scale 1 inch=4 miles. The mines are not indicated.—ED.

sea-level, and 2500 feet above the village of Sumsam or Soomjam (latitude $33^{\circ} 25' 30''$, longitude $76^{\circ} 25' 0''$), on the southern slopes of the divide between Kishtwar and Zaskar. Sumsam is on the Bhutna river, a tributary of the Chenab.

In 1888 Mr. T. H. D. La Touche*, of the Geological Survey of India, examined the deposit at the request of the Kashmir Durbar, as the revenue from it had been diminishing steadily. The rocks of the valley are coarse biotite-gneisses, in places crowded with garnets, and have, interbedded, a band of crystalline limestone and masses of kupfferite. Through these gneisses were intruded the dykes of coarse pegmatite in which the gems occur. This pegmatite consists chiefly of quartz, white felspar and black mica, with, as accessory minerals, large crystals of black tourmaline, light green euclase, kyanite, and corundum. Corundum is essentially the same mineral as ruby and sapphire, but is the opaque, non-precious variety used for abrasive purposes. Chemically, corundum, ruby and sapphire are alumina; the difference in colour is supposed to be due to minute traces of chromium in the ruby and titanium in the sapphire. The "emery" of commerce is impure corundum. In the pegmatite itself, sapphires are very scarce and local, and the output of stones has come almost entirely from a narrow strip of debris, weathered from the pegmatite in the steep slopes along the northern side of the valley. The yield of sapphires decreased towards the lower end of the deposit, and also rapidly from the surface downwards; below a depth of three feet none were seen.

La Touche constructed a simple apparatus in which the debris could be washed and the sapphires picked out. Most of the stones were small fragments, some not much larger than a pin's head, and crystals, the great majority showing poor colour and being of little value as gems. Occasionally, however, a larger stone of good colour was found. In 1887 the largest weighed about 6 oz., and was partly of a very brilliant colour; but in 1888 the largest weighed only 104 grains, and very few were of more than 50 grains in weight. Much finer stones were found when the mine was first discovered, and La Touche was shown in the Treasury at Jammu some which measured 5 inches in length and 3 in breadth; and though all of them shaded off into white at either end of the crystal, still some very fine gems could be cut from them.

* *Records, Geol. Surv. Ind.*, XXIII, pt. 2, pp. 59—69 (1890).

The valley is under snow except during the months of July, August and September. In 1888, the year of La Touche's visit, the working season lasted from the 17th July to the 29th September, and the total quantity of corundum and sapphire obtained in that time was 42 lbs., of which about a quarter would be commercially valuable, but the average weight of the stones, calculated by La Touche from the results of 25 days' working, was not more than 10 grains. For some years the Durbar derived a considerable revenue from the mines, which were then abandoned under the impression that they had been worked out. In 1906 work was re-started by the Kashmir Mineral Company, and at first several valuable stones were obtained. Very soon however the production again fell off, and ceased in 1908. In 1906 the output was valued at £1327, and in 1907 £3144. One stone sold for £2000. In the summer of 1927 the deposit was again worked experimentally, with good results, by the Mineral Survey of Kashmir and Jammu under Mr. C. S. Middlemiss. It is evident that the area has not been exhausted, for elaborate policing has become necessary to prevent stealing. A few pale rubies, and red and green tourmalines have also been found near the mines.

La Touche investigated a beryl locality situated at an altitude of 12,000 feet, and four miles to the west of Matsel (or Machel), a village on the Bhutna river four miles below Sumsam. The few beryls found were very poor in colour, bluish-green shading into white. He was shown a few sapphires, of a blue colour shading to a greener tint, in a block of granite lying on the moraine near the head of the glacier which descends from the southern side of the Hagshu La, one of the passes leading from the Bhutna valley into Zaskar.* He was informed that sapphires had been found above the monastery of Bardun in Zaskar. Calvert, in his book *Vazeeri Rupi* (Kulu), reported that he found sapphires on the ascent to the Hamtah pass ($32^{\circ} 16'$; $77^{\circ} 21'$; map 52 H/sw) in Kulu, but the statement requires confirmation, as the specimens do not appear to have been shown to a competent authority.†

Aquamarines occur at Daso, in the northern Shigar valley of Baltistan, and were first discovered in 1915 by Lala Joti Prasad, of the Mineral Survey of Jammu and Kashmir State, excavated by him in

* A traveller in 1925 reported that the Hagshu no longer exists as a practicable pass.—Ed.

† The Hamtah pass was surveyed in the modern style in 1921. The topographical surveyor did not find any sapphires here.—Ed.

the following year, and examined by Mr. C. S. Middlemiss* in 1917. Daso (35° 43'; 75° 31'; map 43 M) lies at a height of 8300 feet on the Braldoh river a few miles above its junction with the Shigar, and the aquamarines, like the sapphires already mentioned, occur in veins of pegmatite which traverse the prevailing biotite-gneiss of the region. The largest veins of pegmatite are the coarsest, and are the most productive in aquamarines. The commonest minerals are quartz and felspar, after them tourmaline and muscovite, and then beryl (or aquamarine) and garnet. Beryl is the mineral species (a complicated silicate of aluminium and beryllium) of which emerald and aquamarine are the clear gem varieties. The green colour of emerald is believed to be due to minute traces of chromic oxide, and the blue-green of aquamarine to iron. The central portions of the large veins are sometimes composed essentially of felspar, and in these the beryl prisms are closely set. Whilst most of these are common opaque beryl, or only a translucent variety, a few are transparent enough for cutting; the latter are usually found projecting as beautiful crystals into cavities in the masses of felspar. Besides the transparent aquamarine and the common, almost opaque beryl, there occurs an intermediate translucent variety of delightful deep green colour, suitable for buttons and beads.

The size of the opaque and translucent beryls is generally from $\frac{1}{2}$ inch to 2 or 3 inches in width, and from 2 to 6 inches or more in length. The transparent aquamarines are smaller as a whole, averaging from $\frac{1}{2}$ inch to $1\frac{1}{2}$ inches wide and 2 to 3 inches long in the more perfect specimens. One exceptionally large crystal, 10 inches long and 5 inches wide, weighing about 13 lbs., was obtained in 1915.

The Daso aquamarines are of a pale, delicate tint, and of excellent limpidity, but the depth of colour is usually less than is called for by the present vagaries of fashion. By artificial light the tint is considerably deepened, and some of the larger pendant forms on view at the Wembley Exhibition in 1924 were much admired.

In ten days' experimental working, employing 25 men at a total cost of Rs. 178 for wages, explosives and fuel, about 1760 cubic feet of pegmatite were excavated, yielding 3100 grammes (6 lbs. 13 oz.) of clear aquamarine, 3350 grammes (7 lbs. 6 oz.) of the intermediate translucent variety, and about 102 lbs. of rough beryl. Reckoning one carat at 0.20 grammes or 3.1 grains approximately, large pieces of aquamarine, uncut, were sold at 6 annas a carat, small pieces at 2

* *Records, Geol. Surv. Ind.*, XLIX, pt. 3, pp. 161—172 (1918).

annas a carat, and large pieces of the translucent beryl at an anna a carat; the total value of the ten days' takings was reckoned at Rs. 4577, from which has to be deducted transport, supervision, sale charges and profits. Cost of transport from the mines to the railway is Rs. 9-4-0 per maund (Rs. 10-8-0 per cwt.). Cut stones of the best quality fetched, in 1918, Rs. 2-8-0 to Rs. 3-12-0 per carat in India as sold to dealers. The mines produced 20 lbs. of stones in 1920, and 55 lbs. in 1921. The deposits have only been superficially opened up and a long life for these mines is anticipated. In 1915, 3·75 cwt., and in 1916, 4·13 cwt. of beryl of varying quality, were obtained in Skardu, and are said to have been sold for several thousand rupees.

Beryl-bearing pegmatites are not confined to the village of Daso, but are found within a mile or two; and beyond this again they have been reported from the Basha valleys and the Rondu region, but it does not follow that all these localities will yield the gem variety of aquamarine.

There is another locality in which precious stones occur, though at present little is known about it. Rubies, spinels and garnets, with some sapphires and even, it is said, emeralds, are mined at Jagdallak ($34^{\circ} 22'$; $69^{\circ} 48'$) situated at the crest of the Siah Koh range in Afghanistan, about 5 miles to the west of Kardeathal, in a belt of highly crystalline limestone altered by granite intrusions. The rock is broken by hand and the gems extracted.*

In the Himalaya there is only one record, and that a very doubtful one, of the occurrence of diamond. Some small ones, supposed to have been found in a hill-stream near Simla, are preserved in the Geological Survey Museum at Calcutta. This find is mentioned in a letter to the *Times* of 7th September, 1872, but no details are given.

The semi-precious stones, turquoise and jade, are not worked in the Himalaya, but are brought through the mountains. The turquoise, which is almost universally worn as an ornament by hill-women, and is used in a crushed state for mosaic-work by the silversmiths of Kashmir, probably comes from the mines of Nishapur in Khorassan, that is, when it is not artificial. The mines are situated in a ridge above the village of Maden ($36^{\circ} 28'$; $58^{\circ} 20'$), 32 miles north-west of Nishapur, and the turquoise occurs in trachyte breccias, associated with limestones and volcanic ash beds. A detailed description of the working of the mines and of the economics of the industry has been given by General

* Griesbach, *Records, Geol. Surv. Ind.*, XXV, pt. 2, p. 71 (1892).

A. Hontum Schindler,* who was in charge of the mines in 1882-83. The workings consist of labyrinthine shafts and galleries in the hill-sides at heights of 4800 to 5800 feet above sea-level, and there are alluvial diggings at the foot of the hills in the detritus derived from the turquoise-bearing rock; in these alluvials the best stones are found. About 200 men were employed in General Schindler's time, and the output, valued at the mines, averaged 25,000 toman annually.

Lapis lazuli, from which the artists' ultramarine was made, and which is known in the bazars as *lajward*, used to be imported into India from the mines of Firgamu in Badakshan, now discontinued. The mines are described by Wood, in the narrative of his journey to the source of the Oxus in 1838. This mineral is rumoured to have been found in Hazara and Khelat, but it is liable to be confused with the much commoner basic copper carbonate, azurite, as has also happened in the case of turquoise.

True jade (nephrite) has been worked for many centuries in the Kara-kash valley in Southern Turkistan. The jade of China is chiefly the closely allied mineral jadeite, which comes from the Mogaung division of the Myitkyina district of Upper Burma. The softer serpentinous mineral called bowenite passes under the name of *sang-i-yeshm* on the North-West Frontier, and is evidently regarded as a poor variety of jade, though its characters are unmistakably distinct.

North and east of the gold mine situated three miles north of Kandahar†, both chrysolite, in beautiful bright green and yellowish crystals, and chrysotile in lumps of a light green or yellowish colour, occur in basalt. Chrysolite is a transparent variety of olivine, which when dark green is the "peridot" of jewellers; and chrysotile is a fibrous serpentine allied to asbestos, resulting from the alteration of the olivine of the basalt. Both minerals are used locally for beads for rosaries, the former being the more appreciated.

Rock-crystal (clear quartz) is used for cheap jewellery in Kashmir, and an output of 24 lbs. was reported from the Skardu *tahsil* in 1921. Jasper, a massive variety of quartz, opaque and strongly coloured by impurities, is widely distributed in the Himalaya, and used locally for beads and other ornaments.

Garnets are very common and widely distributed amongst the schists and gneisses of the Himalaya, but have not been used for jewellery, as they are small and of poor quality.

* *Records, Geol. Surv. Ind.*, XVII, pt. 3, p. 132—142 (1884); Griesbach. *Records, Geol. Surv. Ind.*, XIX, pt. 1, p. 62.

† Griesbach, *Memoirs, Geol. Surv. Ind.*, XVIII, pt. 1, p. 56 (1881).

It may be noted that the blue mineral kyanite, which is opaque and rather soft, and is seldom used as a gem, has often been mistaken for sapphire. It is particularly abundant in the schists and granite of Bashahr. Amethyst, a violet form of clear quartz, which is found at several localities in the valley of the Sutlej river in Bashahr,* has also been confused with sapphire, and the pistachio-green mineral epidote is liable to be taken for jade.

From the above notes it will be clear that only the sapphire and aquamarine mines of Kashmir are of any real economic importance. However, great tracts of the Himalaya are as yet unprospected, and though the Himalayan Club would be the last to foster among its members that gambling instinct which characterizes the true prospector, and would deprecate the idea that a fortune is to be picked up as an accompaniment to a mountaineering tour, nevertheless a search for beautiful minerals lends an interest and perhaps even a mild excitement to wanderings over the stony pastures and bare rock which come between the forest and the snow. The chances of finding anything of value are remote, but even mineralogy may perchance be caught up in the net of the Club's activities.

* Griesbach, *Memoirs, Geol. Surv. Ind.*, XVIII, pt. 1, p. 56 (1881).

BIRD NOTES OF A JOURNEY TO GYANTSE.

L. R. FAWCUS.

BEFORE we undertook our journey to Gyantse in August-September, 1929, we were required by the Government to sign an undertaking not to shoot in Tibetan territory. This prevented any collecting being done on the trip, but sufficient bird-life was observed during our somewhat slow marches to make it worth while putting something on record about what we saw.

After crossing the Cho-la frontier of Sikkim and Tibet by the Natu La, we descended into the Chumbi valley. This valley is as different from the arid upland plains of Tibet as is chalk from cheese. Down its centre the Amo Chu splashes its way plainward at a height of about 9000 feet above sea-level, and the fact that the river flows southward reminds us that we are not yet over the great Himalayan divide. The vegetation tells the same story. The orchids, lianes, and tropical luxuriance of Sikkim are gone, but the hill-sides are clothed with trees and the shrubs grow with the vigour of well-watered temperate zones.

We saw our first Chough as we came down the steep slopes from the Natu La to the Amo river. It was the Red-billed Chough (*Pyrhcorax pyrrhcorax*), a bird common in the Chumbi valley and ubiquitous on the Tibetan plains. Wilder and less businesslike than the Crow, and lacking in the Raven's dignified aloofness, it resembles most our English Jackdaw in its short restless flights round its rocky breeding-haunts and its occasional spasms of excitement over food or in conflict.

We never saw the Yellow-billed Chough (*Pyrhcorax graculus*) on the Tibetan plains; one member of the party saw a flock of small choughs feeding on berries near Yatung, which were probably of this species, but it seems probable that *P. pyrrhcorax* is the dominant species of the open country between Gyantse and Sikkim, while *P. graculus*, where it exists, is a forest-loving bird. The Jungle Crow (*Corvus coronoides intermedius*) inhabits the Chumbi valley but gives place to the Tibetan Raven (*Corvus corax tibetanus*) where the Goutsa gorge rises from that valley to the great plains.

In the bed of the Amo Chu we constantly met three common Sikkim birds, the Himalayan Whistling Thrush (*Myiophonus teminckii teminckii*), the White-capped Redstart (*Chaimarrhornis leucocephala*) and the Plumbeous Redstart (*Rhyacornis fuliginosa fuliginosa*). None of them seemed to penetrate further than the broken country where the Goutsa gorge debouches on to the Phari plain. There is, indeed, a sharp line of demarcation between the species of this valley and the upland plains. A few strong fliers such as the Lämmergayer (*Gypaëtus barbatus grandis*), the Black-eared Kite (*Milvus migrans lineatus*), and the Great Himalayan Griffon (*Gyps himalayensis*) soar indifferently everywhere; but of the smaller birds observed, three only appeared common in both areas during the months we were there. These are the Grey-backed Shrike (*Lanius schach tephronotus*), the Tibetan Hoopoe (*Upupa epops saturata*) and the Rufous Turtle Dove (*Streptopelia orientalis orientalis*). In habits they resembled their European and Indian congeners, and were therefore necessarily confined to the village sites and to the small groves of *Salix* and *Hippophae* which are practically the only trees which break the desolation that reigns between Phari and the Tsangpo river. To these three should also be added the Tibetan Tree-Sparrow (*Passer montanus tibetanus*) but round Gyantse its pride of place was disputed by the more striking Cinnamon Tree-Sparrow (*Passer rutilans cinnamomeus*).

The transition in scenery between the Chumbi valley and the great plains is most striking. For two days' march the road winds upward from Yatung, first merging into the grassy Lingmatam plain, where the river winds through lush water-meadows reminiscent of the Wey near Guilford; from the head of this small plain the path rises steeply through thickly wooded gorges to Goutsa (12,300 ft.) and thence over rough stones beside a broken torrent to the rolling downs where the fierce Tibetan wind is first felt, culminating at about 1400 feet in the Phari plain. Henceforward trees are left behind and the traveller sits nightly over the evanescent blue flame of a yak-dung fire, eked out by the hard turves which also serve for house-building purposes. The wide Phari plain is the grazing-ground of countless yaks and conjures to the mind what the plains of Kansas or Missouri must have looked like before the steam tractor replaced the herds of buffalo. Twice in an afternoon, as we rode over the plain, we saw wolves emerge from ravines apparently on the look-out for straggling calves. Here we first met the strange little Ground Chough (*Podoces humilis*).

This bird is totally unlike the true Chough and though for systematic purposes it is usually placed near the Nutcrackers (*Nucifragæ*), its outward appearance and flight suggest, as Jerdon points out, affinities with the *Timelinæ*. It is entirely a ground bird and its low short flight resembles that of *Crateropus* or *Argya*; when however it alights, it invariably proceeds to dip or bob two or three times and then to progress forward by a series of hops or leaps. One is tempted to conjecture that absence of enemies is rendering flight useless in this treeless plain, and that with atrophy of wing power the evolution—or rather reversion—of a cursorial bird is in process. In spite of the presence of wolves one can postulate absence of enemies of birds and small mammals from the fact that around Phari the plain is covered with the holes of the Pikas or Mouse Hares. Hardly a minute passes when one of these little animals is not visible sitting up, prairie-dog-like, over its hole, or scuttling to shelter almost from under the hoofs of the observer's pony. The holes of these animals are inhabited by a Snow Finch, but I was unable to ascertain whether this takes place during actual occupation or after desertion by the original tenant. Instances are on record of birds and animals occupying the same burrows (I believe this occurs in the case of prairie dogs and owls and of rabbits and puffins) and it would be interesting to have further details on the subject from an observer who has leisure for investigation. There appeared to be two species of Snow Finch, one with an almost complete buff band on its neck and noticeably dark markings at the gape or rictal area of its beak, and a larger one without the buff band on the neck but with a light-coloured rump. Possibly the two birds were the Tibet Snow Finch (*Montifringilla nivalis adamsi*) and Mandelli's Snow Finch (*Montifringilla taczanowskii*), but I have no means of ascertaining. The commonest of the *Alaudidæ* on Phari plain was the Horned Lark (*Otocorys alpestris*). This bird appeared to have a somewhat limited range at the season of our visit, for though it was very numerous between Phari and Kala I do not think we saw it elsewhere.

On our return journey late in August, a richly-coloured Hedge Sparrow (either *Prunella rubeculoides* or *P. strophciata strophciata*) was common in the cultivated parts of the plain.

A few miles beyond Phari the road crosses the main Himalayan range by the Tang La, passing close by Chumolari. The plain here is the home of many Kiang (*Equus hemionus*) whose curiosity sufficiently masters their fear of man to impel them to approach within some eighty yards and gaze at motionless travellers. Behind the

bungalow at Tuna (14,700 ft.), which lies at the head of this plain, many Red-billed Choughs nest in crevices of the rocks, and the Hill Pigeons (*Columba rupestris turkestanica*) abound even in the village streets. The commonest lark in the fields adjacent to the village is Hume's Short-toed Lark (*Calendrella acutirostris*). Beyond Tuna lies the Hram Tso (sometimes spelt Bam Tso) or Otter Lake. This is the breeding-ground of several species of water-birds which visit Bengal in the cold weather. At the time of our visit (the third week in August), broods of nearly full-grown Brahminy Duck (*Casarca ferruginea*) and Bar-headed Geese (*Anser indicus*) were plentiful at the edge of the lake. In the plains these birds are habitually shy, but up in their breeding haunts their terror of man was almost gone. We often rode within thirty yards of resting birds which a few months later would rise at the first far-discerned sign of human approach. Most of the ducks and geese were at the edge of the lake; further out we could see families of the Great Crested Grebe (*Podiceps cristatus cristatus*) leisurely swimming and diving. It was strange to think that the last time I had seen the identical sight we were now witnessing at 14,000 feet had been in Virginia Water Park, almost in the suburbs of London. Over the marshy edges of the lake many Tibetan Terns (*Sterna hirundo tibetanus*) were hovering, and from the sedgy grasses Redshank (*Tringa totanus terrignotæ*) continually rose with plaintive cries. There were, as far as we could see, no other waders there; but at a streamlet between Tuna and Dochen a solitary Green Sandpiper (*Tringa ochropus*) was bobbing in a familiar manner. The path beside the lake was overhung by cliffs round which several Pallas' Fishing Eagles (*Cuncuma leucorypha*) were circling, and from time to time making a foray in the direction of the lake. After a successful raid the captor would sit looming on some small eminence hunched over his booty for all the world as if he were on the ail of a Bengal paddy-field. Some of these eagles were in immature plumage; it would be interesting to know the time they breed. In Bengal they commence to nest in November and bring up their young in mid-winter, but it is hardly conceivable that they can nest at that time of the year on these frozen plains. Either therefore they migrate in winter to a warmer climate to breed, or they bring up their young in the milder months of June and July.

At the edge of the lake we saw two Black-necked Cranes (*Megalornis nigricollis*), fine birds in full and conspicuous black and white plumage. Two days later at the head of the Menza plain we saw an immature specimen of the same bird. This plain marks the end of

the treeless area ; thenceforward we followed the course of the Nyang Chu to Gyantse, welcoming once more rushing water and groves of trees in place of the sombre monotony of windswept steppes and vast chilly meres. These groves are the home of the Black-rumped Magpie (*Pica pica bottanensis*), a very close relation of our English Magpie, and so far as we could judge, very similar in habits. In the rocky valley two redstarts, the Eastern Indian Redstart (*Phænicurus ochrurus rufiventris*) and Hodgson's Redstart (*Phænicurus hodgsoni*), were very common and in the barest and most desolate ravines the Tibetan Desert Chat (*Oenanthe deserti oreophila*) sat flirting its tail on many a rock. These valleys bear a striking likeness to the narrow "Valley of the Kings," through which the dead Pharaohs were borne westward to their rocky tombs ; in that sombre valley too the only living bird that greets the traveller is a small dusky Chat.

After Saugong the valley widens into the fertile Gyantse plain and the road winds for some fifteen miles with the plain on one hand and on the other vast frowning rocks crowned by almost inaccessible monasteries. The torrent of the Nyang Chu is haunted here by the Ibis-bill (*Ibidorhynchus struthersi*) but this bird, though well known, is not common and we failed to see one. The plain at Gyantse is some four miles wide, girt on each side by steep hills—the home of the Burrhel (*Ovis nahura*), the Blue Poppy (*Meconopsis horridula*) and the Snow-Cock (*Tetraogallus tetraogallus centralis*). On the plain, barley and small peas grow luxuriantly in the short summer season fostered by a mazy system of irrigation channels that impede progress everywhere except on the beaten track. It was late August when we arrived there and we found that the Pintail Snipe (*Capella stenura*) had just arrived on their southern migration ; we were told by the officers in the fort that these birds always preceded the Fantail Snipe (*Capella gallinago gallinago*) by some weeks. Grey-backed Shrikes (*Lanius schach tephronotus*) and Tibetan Hoopoes (*Upupa epops saturata*) were the commonest birds in the bushes which skirt the river, while in the open fields we saw the familiar sight of skylarks (*Alauda arvensis inopinata*) hovering and singing.

Flocks of Tibetan Twite (*Acanthis flavirostris rufostrigata*) and Cinnamon Tree-Sparrow (*Passer rutilans cinnamomeus*) abounded among the bushes and lent splashes of rose and ruddy brown to the dark shadows of the buckthorn, and those who visited the monastery the morning after we arrived were fortunate in seeing on the way a bright crimson Wall-creeper (*Tichodroma muraria*) running over the sombre walls of the Tibetan fort.

It was a matter of great regret to all of us that our time at Gyantse was limited to four days, which just sufficed to show us how much there was to be seen. The bare outline of the bird-life given above will have richly served its purpose if it induces any bird-lover visiting south-eastern Tibet to allow himself leisure to study the habits of these and the many other birds which inhabit this out-of-the-way corner of the world.

THE SHYOK FLOOD, 1929.

I. THE BURSTING OF THE CHONG KUMDAN DAM.

J. P. GUNN.

IN the first volume of this *Journal* Mr. Ludlow told of his attempts to reach the Chong Kumdan Dam. There is therefore no need to repeat the details of the route. This year, benefiting by his previous experience, he was able to guide our camp straight up to the glacier.*

Personally I had only the vaguest idea of what a glacier looked like at close quarters and was somewhat disappointed to find it resembling nothing so much as a great heap of shingle with a few white points projecting from its surface. I had expected to see a large mass of white ice, with transparent pinnacles, and I was quite prepared to find the whole mass of the same transparency as ice on a pond. A little reflection showed that from the very nature of a glacier's movement, the only possible structure for its main body, was a granular form of ice, and as it dawned on me that this was a most excellent structure for localizing the effects of an explosion, I wondered whether the exponents of the "blowing-up" method of dealing with the dam had devoted much attention to the nature of glacier ice.

The dam was a mighty mass of ice, rather too big for one to appreciate its full size, but dwarfed by the surrounding hills, rising from three to six thousand feet above the highest pinnacles. Seen from the hillside above, the ice in the river-bed appeared roughly square in plan; measurement showed it to be four thousand feet long across the bed, and about five hundred feet high.

From its size I was of the opinion that the only way failure could occur was by the water in the lake overtopping the dam; and from the structure of the ice, I was sure that the main body of the dam would offer no great resistance when this occurred, and that a big flood was bound to be the result.

From Ludlow's information it was obvious that the lake was much larger than in August the year before. We therefore determined to ascertain its volume. After inspecting the dam from the north I

* A map of the Upper Shyok appears in the *Himalayan Journal*, Vol. I, p. 5.

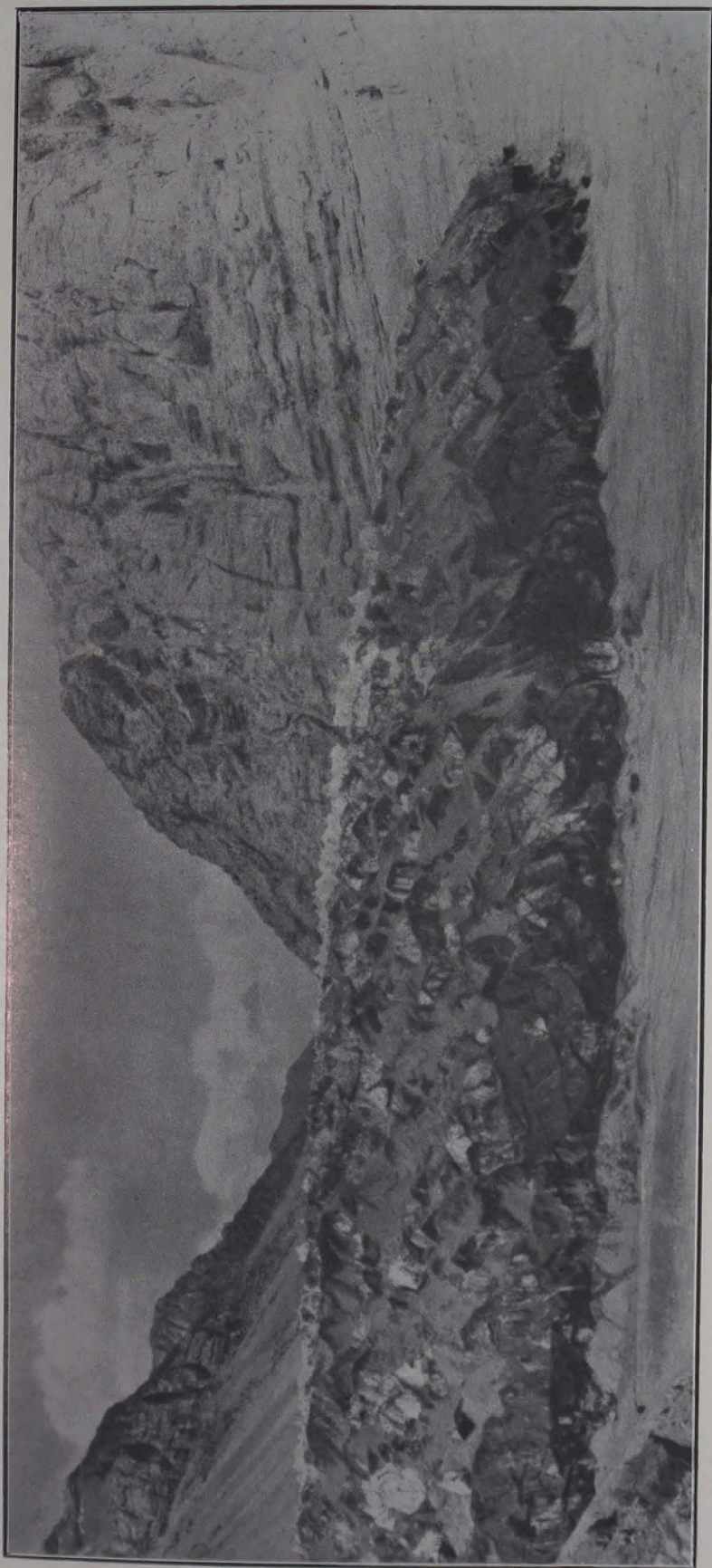
concluded that it would not be overtopped for at least another two months, and that probably it would not break till the following year, since before long the rate of melting of the glaciers feeding the lake would decrease. All the time we were down at the dam on 12th August loud creaks and "groans" were heard, lasting some time, as ice-floes broke off the main body. Both Ludlow and I considered that when the dam did fail, it would break up rapidly.

When we had finished our work at the lake, Ludlow went on to Kashgar and I returned from Daulat-Beg-öldi. On my return journey, as I approached the Shyok from the ravine leading to Murgo, I noticed a few blocks of ice lying at the foot of a side nullah and looked up to see where they could have fallen from. While I was still looking up I turned the last bend and on glancing towards the Shyok, the first thing that struck me was that the shingle bar at the mouth of the ravine had changed its shape. Then I observed that the whole bed of the Shyok was covered with ice-blocks, and realized at once that the dam had burst.

The Shyok river was still in moderate flood, though this was the 17th August and more than forty-eight hours after the dam burst, as we discovered afterwards. I therefore gave orders for the *zak*, the local form of raft made of inflated skins, to be got ready, while I set off up the left bank to see whether there was a practicable road. The skins had not been used for some time and had to be soaked. It was therefore not till the early morning of the 19th that I was able to ferry a light camp across the river and pitch my tent at sunset some three miles below the dam.

All the way up from the river there were evidences of the magnitude of the flood. Ice-blocks up to twenty feet cube were scattered about the banks of the river, sometimes seventy feet and more above the river-level, while occasionally there was a gigantic block about fifty feet cube by way of variety. All the shingle mounds in front of the Aktash glacier had been washed away, and the terminal pinnacles eroded. In backwaters the ice was piled up in regular beaches in steps anything up to six feet high and fifty feet wide, one above the other, and from the general appearance of the river-bed, I was sure that very little of the glacier was left.

Almost every time I had guessed anything about this glacier, I had guessed wrong; and this was no exception. From my camp I could not see the whole of the glacier, but except for a few more white patches than were visible before, I could observe no change in the glacier at all! At last some idea of the immensity of the glacier



Photo, J. P. Gunn.

THE CHONG KUMDÁN GLACIER SNOOT FROM DOWNSTREAM BEFORE THE DAM BROKE.

began to impress itself upon me. The channel, through which the whole of the water in the lake had escaped, was barely noticeable. Yet the water in the lake, before the flood, had been sufficient to cover an area of ten square miles to a depth of a hundred and seventy feet. I find it even now extremely difficult to convey any idea of the magnitude of the dam, or of the volume of water which passed through it; and I must leave the photographs to show how very little the dam was affected.

On the 20th, when I approached the dam I was able to see clearly what had occurred. The dam had burst along a curved line extending from near the right bank of the lake on the northern side, through the *highest* portion of the dam, nearly to the left bank of the river at the southern side. The cut, through which the water had escaped, was about four hundred feet wide, and the ice stood almost vertically on either side. A small quantity of water had blown a hole in the right side of the cut, as can be seen in the left foreground of the illustration. The lowest part of the dam, the low gully along the cliffs at the snout, which I had considered the danger point, was unaffected.

In only one particular were my anticipations of the bursting of this dam correct. I predicted that when the dam broke, there would be a big flood, in all probability larger than that of 1926. And it was so.

II. THE SHYOK FLOOD IN THE GILGIT AGENCY.

H. J. TODD.

Since despatching my letter giving details of the floods which have occurred in the Gilgit Agency,* the long expected "Shyok Flood" has come and gone, and curiously enough I happened to be the first person within easy reach of telegraphic communication to witness its arrival in the Indus, where the latter passes through the Gilgit Agency.

I was returning from Kashmir to Gilgit, and on the morning of 17th August, had left Bunji at four o'clock to ride the seventeen-mile march to Pari. On this march the road crosses the Indus river, by the Partab Pul, some seven miles beyond Bunji, and here I arrived about half-past five.

It was apparent that something was wrong. At that time of the year the Indus is about at its maximum summer flood-level, but the Partab Pul can always show a clearance of some 45 or 50 feet. When I arrived, there seemed to be little more than a 20-foot clearance,

* See Mr. Todd's letter on page 173.

and the water was coming down in a dark chocolate-coloured flood, carrying large quantities of drift-wood, as if the river had just succeeded in washing its banks of the deposits of previous floods. Shortly afterwards, however, appeared an occasional large uprooted tree, and innumerable poplar poles, cut in regular lengths as if for building purposes. Later, boards and roofing material began to arrive, clearly indicating the fate of some unfortunate village in Baltistan.

A road gangman, who had been sleeping at the bridge-head, informed me that he had first noticed an unusual rise some three hours before my arrival.

My thoughts, of course, immediately flew to the Shyok dam. With the aid of a stone, on a piece of string, I was able to calculate that, at 5-30 A.M., the river was 18 feet below the lowest cross beams of the roadway structure.

An hour later the river had risen to within 12 feet and all doubts as to the origin of the flood immediately disappeared. A levy was sent galloping in to Bunji to wire the news to Kashmir, and Bunji and Chilas were warned to take all precautions, and to commence recording the rise of the river for the information of the authorities down in India.

At 7-30 A.M., the flood had risen another 3 feet, and at 8-15 A.M. it was only some 6 feet below the bridge.

The flood was now beating strongly against both abutments of the suspension bridge, and occasionally a high wave in midstream would dash against the bridge roadway and cause it to swing perilously.

At 8-45 A.M., the flood was within 5 feet of the bridge, but at 9-30 A.M. it was a great relief to find that there was no further rise to record, and, if anything, the midstream waves were striking the bridge less frequently.

The worst was over and the bridge was safe.

At 9-45 A.M., the levy returned from Bunji and was able to recross the bridge with his pony. He reported that the Post Commandant at Bunji had now got going, and the readings at the regular gauge there were being recorded and wired to Srinagar.

At 10 A.M., the river was distinctly quieter, and at 10-30 A.M. I had to continue my march, leaving a watch at the bridge. By 2 P.M. the watch reported a fall of 4 feet.

I always make it a practice to carry a camera with me on trek, but this morning of all mornings, my bearer had noticed that the sling was becoming unstitched so had packed the camera in my yakdan and sent it ahead! I thus lost the unique opportunity.

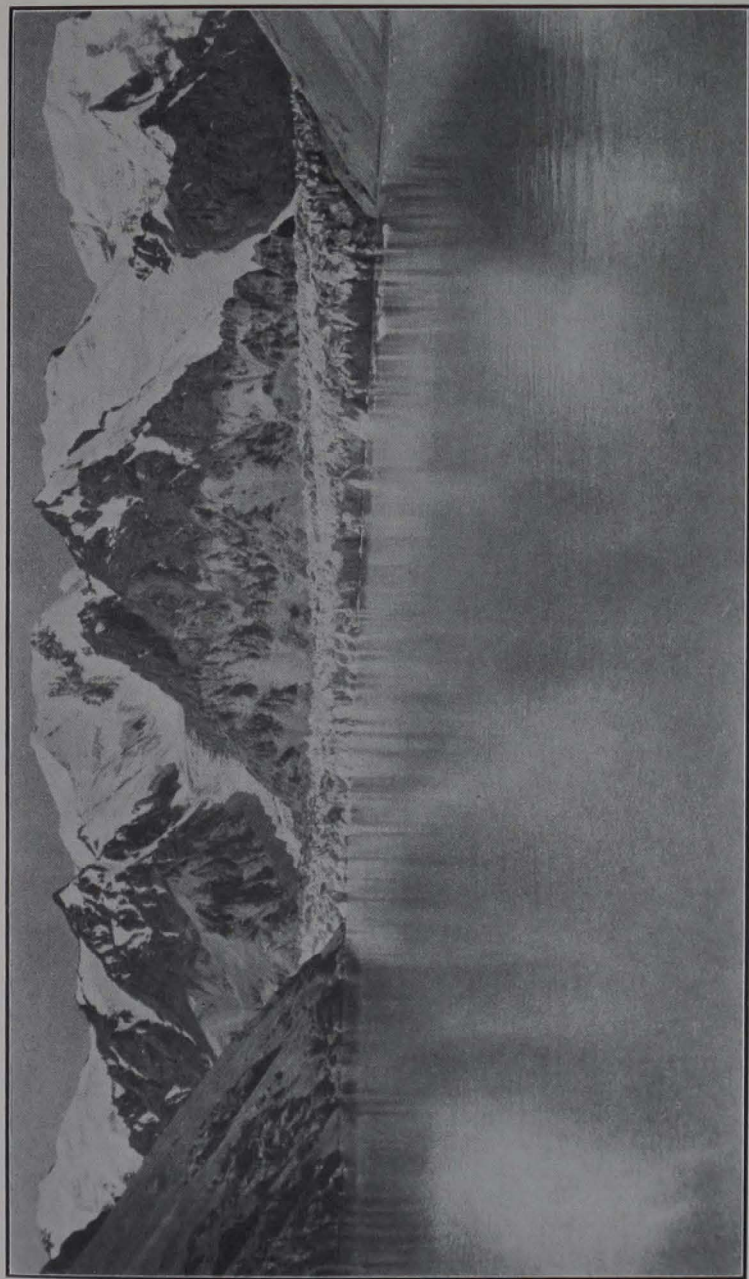


Photo. F. Ludlow.

THE CHONG-KUMDAN DAM FROM THE LAKE, 12TH AUGUST 1929.

The Partab bridge is the only means of crossing the Indus during the summer months, and it is of course during these months that the supplies for the Gilgit garrison are sent up from Kashmir. Had the bridge gone, a most awkward situation would have arisen, as there would have been no chance of re-erecting the bridge until the autumn at least, when it is again possible for a ferry to ply safely.

At Partab Pul the Indus flows between very high cliffs and the actual length of the bridge is 330 feet.

For some days before the flood, a phenomenal heat wave was being experienced in the Gilgit Agency, and doubtless its effect was felt at the Shyok dam. At Gilgit itself a temperature of 112°F. was recorded on 13th August, two days before the dam burst, the previous summer record being just over 105°F. For this reason the Gilgit, Hunza and Indus rivers were undoubtedly somewhat higher than usual, but the increase over normal summer level could not have been more than a few feet.

On 7th May the Partab bridge was 57 feet above the river-level and on 1st August the clearance was 51 feet. By noon on 19th August the river had returned to its pre-flood normal level, giving a fifty-foot clearance.

At Bunji, where the river has more shelving banks, and is much broader, hourly observations were taken from 7 A.M. until 10 P.M. on the 17th, and again from 5-30 A.M. to 3 P.M. on the 18th, when the river had returned to 4 feet above normal. The highest point, 35 feet above normal, was reached at 10-50 A.M. on the 17th, at which it remained for nearly 2½ hours. The river became normal again at Bunji at noon on the 19th.*

At Chilas the river was first reported to be rising at approximately noon on 17th August, and reached a height of 53 feet above normal about midnight. On the morning of the 18th the river was subsiding and reached its normal on the evening of the 19th. No detailed measurements were recorded and the above information is therefore only approximate.

No loss of life was reported in this Agency, and the damage to property was very small.

* The gauge readings sent by Mr. Todd have been plotted on the chart accompanying my paper below. Details of the observations at all points, including those in the Gilgit Agency, are being deposited in the Library of the Himalayan Club.—ED.

III. THE SHYOK FLOOD : A COMMENTARY.

MAJOR KENNETH MASON.

The bursting of the Shyok dam gives rise to many speculations : the inhabitant of the plains of India south of Attock, the hydraulic engineer and the glaciologist are all concerned. The first must have thanked his gods that the dam burst on the morning of the 15th August, and not on that of the 25th. Had it collapsed on the latter date the liberated waters would have arrived at Attock at the same time as the higher flood caused by an unprecedented rainfall in the Kabul river basin, and the combined floods must have done an appalling amount of damage in the plains. The plainsman may speculate on the likelihood of other such visitations, and he may not know that, coming as it did, some ten days before the rain-flood, the Shyok burst was a blessing in disguise, for it caused little damage, scoured out the bed of the Indus and so gave a better "run-off" for the rain-flood.

In a most interesting paper published by the Punjab Government, Mr. J. P. Gunn has investigated very thoroughly most of the problems connected with the hydraulic aspect of the Shyok flood.* Reports and letters have also reached me from Khan Sahib Afraz Gul Khan, of the Survey of India, who was camped at Daulat-Beg-öldi, when the dam burst, from Mr. H. J. Todd, the Political Agent at Gilgit, who was actually crossing the Partab Pul, when the flood passed that place, from Lieut. J. Barron, in charge of the Kashmir State Artillery, stationed at Bunji, and from Major G. V. B. Gillan, the First Assistant to the Resident in Kashmir. All these gentlemen are members of the Himalayan Club. I am also indebted to Mr. S. Walker, Chief Engineer and Secretary for Irrigation, North-Western Frontier Province, to Major C. F. Carson, R.E., Bridge Engineer of the North-Western Railway, and to Brigadier E. de L. Young, Chief Engineer, Northern Command, for details above and below Attock. It is not possible to publish all these communications in detail.

Khan Sahib Afraz Gul Khan at a distance of 19 miles from the dam heard the first breaking of the ice "like the noise of a cannon-shot" at 5 A.M. on the morning of the 15th August ; and during the day occasional "booms" were heard by him and members of the Visser expedition, which they attributed to breaking ice. This points to the conclusion that the dam did not collapse instantaneously and completely, a conclusion supported by Gunn's observations at the

* *Report on the Kumdan Dam and Shyok Flood of 1929.* By J. P. Gunn.

dam itself. The form of the "wave-curve" at Saser Brangsa, ten miles below the dam, shown in the accompanying chart, indicates, however, that the first break must have been the main one. If the records gleaned by Gunn from the ford-guard at Saser Brangsa are trustworthy, it appears that a channel was probably cut through the top of the dam at first, and that a second break occurred, probably about 11 A.M.* This second break allowed the lake to be completely emptied, and the waters released by it seem to have arrived at Saser Brangsa about 4-30 P.M.

Gunn, who had been sent by the Punjab Government to investigate the Shyok dam, and who was accompanied by Mr. F. Ludlow, whose account of the situation in 1928 was published in the first volume of the *Himalayan Journal*, examined the dam from the lake side less than a week before it burst. He records that the lake at the time of release was approximately four hundred feet deep at the dam, and that its volume was approximately 1,095,500 foot-acres. The main channel through which the water escaped was surveyed by him afterwards and found to be only four hundred feet wide and to have vertical sides. This channel was cut diagonally from near the right bank of the river upstream of the dam, and emerged on the downstream side near the left bank. There was no break adjacent to the wall of rock against which the ice impinged, and where weakness seems to have been expected owing to radiation. The incomplete burst at first and the narrowness of the channel must, I think, account for the time taken for the flood to cover the first ten miles to Saser Brangsa, where the rise was only 85 feet in four hours.

From this point the flood was contained in a valley with a steep fall, and when it reached Khalsar, 135 miles from the dam, it had concentrated into one huge turbulent wave, which passed that place almost entirely in eight hours, the maximum height of 63 feet being reached in two hours. Gunn surmises that this concentration was assisted by a large shingle bar, which was removed during the passage of the flood, and he records that the bed of the valley at Khalsar was scoured out to a depth of nine and a half feet. He also gives some most instructive comparisons between the 1926 and 1929 flood-marks, between Khalsar and Deskit.

* The breaking of the Khurdopin glacier dam in the Shingshal valley in 1907 was incomplete, a channel being cut through the upper part of the glacier. In this case the rest of the ice remained intact, and the lake was not emptied. (*Unpublished report by Major F. H. Bridges, see also Mr. H. J. Todd's letter on page 173.*)

Gunn remarks that he and others (amongst whom I must plead guilty) over-estimated the reservoir effect of the broad Nubra valley, which enters the Shyok a short distance below Khalsar. The 1926 flood, he records, did not reach the village of Burma, some five miles up the Nubra, and on the right bank; while the 1929 flood destroyed the village. The reservoir formed in the Nubra by the flood of the Shyok was a mere five thousand acres in extent. This reservoir question is one for the hydraulic expert; but whether the Nubra valley above the Biagdangdo gorge, or the open ground near Khapalu below it, was responsible, the fact remains that the rise at Skardu, 175 miles below Khalsar, was only 25 feet, in spite of the fact that this is below the confluence of the Indus near Gol. The main flood took eighteen hours to pass Skardu, as against eight hours at Khalsar.

To my mind, the extraordinary feature of this flood, which I, and I believe others, failed to realize beforehand, was its amazing recuperative power between Skardu and Partab Pul. These places are 137 miles apart, and they are separated by a very confined V-shaped water-worn valley. While the height of the flood dropped from 63 feet at Khalsar to 25 feet at Skardu, after the passage of 175 miles, nevertheless it rose again to 45 feet at Partab Pul, 137 miles below Skardu. Partab Pul is just below the great "knee-bend" of the Indus, at which point the flood seems to have banked up considerably. Mr. H. J. Todd's account of its passage between the cliffs and under the bridge here gives some idea of its turbulence. Though he records that prior to the flood, the Indus, Gilgit and Hunza rivers probably were a little higher than normal, owing to the phenomenal heat-wave, this increase can have had very little effect in raising the flood-level.*

In the broad Bunji valley the maximum height of the flood dropped rapidly to 35 feet in seven miles, as indicated by the very full series of observations taken hourly at Bunji itself. But if reliance

* It is curious that the several floods caused by the bursting of the Shingshal and Karumbar glaciers in the Gilgit Agency, details of which are given in a letter from Mr. Todd, the Political Agent, on page 173, should have passed apparently unnoticed at Attock, or at any rate caused no despondency at that place. One of these, due to the bursting of the Khurdopin glacier in 1905, caused a rise of 30 feet at Bunji, only 5 feet below that of the Shyok flood of 1929. The Khurdopin flood of 1906 was reported at one place to be 25 feet higher than that of 1905, and so was presumably as high at Bunji as the flood of 1929.

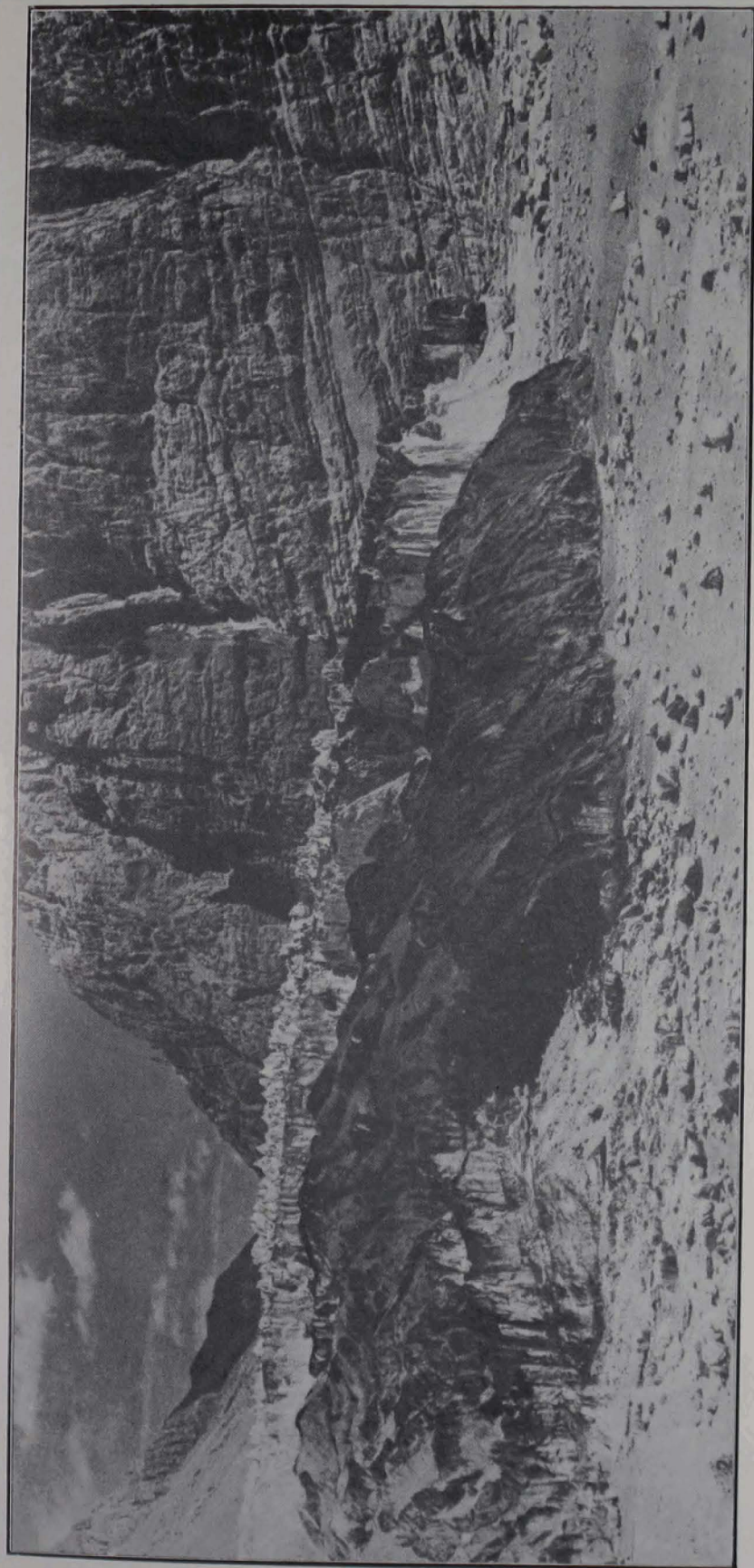


Photo. J. P. Gunn.

THE GLACIER AFTER THE BURST, SHOWING THE 400 FT. DIAGONAL CHANNEL CUT BY THE LIBERATED WATERS.

can be placed on the scanty records at Chilas, it had, after the passage of another restricted valley, again risen to 53 feet, only 45 miles lower down. Below here the Indus enters the most confined gorge of its whole course, and we can only conjecture what height the flood may have attained. At Torbela, about 696 miles from the dam and 243 below Bunji, where the Indus again flows through more open country, the rise was only 16 feet ; at Ghazi, 13 miles lower, still 14·5 feet ; and at the Attock bridge, 742 miles from the dam, where the river is temporarily confined again, 26·9 feet. Gunn calculates that of the total volume of 1,095,500 foot-acres of water impounded by the dam, 884,300 foot-acres passed Attock in three days. Below Attock the flood soon was dissipated ; at Bilot, 160 miles further, its height was only 2·76 feet, while the rise at Dera Ismail Khan was only 1·6 feet.

I have gone into these figures at some length, because those at Partab Pul, Bunji and Chilas do not seem to have been available when Gunn wrote his report. They emphasize in an extraordinary manner the recuperative effect of floods when passing through gorges, especially when they are markedly V-shaped, and when they have no reservoir, such as the Nubra valley above them. They show also how rapidly the height of the flood falls when the waters flow between shelving banks. The upper currents during the passage of a gorge must be far swifter and more violent than those below, to enable the rear portion of the wave to superimpose itself upon the peak. I doubt whether anyone anticipated that the height of the flood-wave at Attock would actually be greater than at Skardu, 432 miles upstream of it !

I calculate the velocities of the flood peaks between the different stations as follows :

Saser Brangsa,		approx. alt. 15,200 ft.			
Khalsar	..	10,200	125 miles.	5·2 m.p.h.	
Skardu	..	7300	175 "	12·5 "	
Partab Pul	..	4190	137 "	13·7 "	
Bunji	..	4100	7 "	8·4 "	
Torbela	..	1160	242 "	11·7 "	
Attock	..	890	46 "	3·7 "	
Dera Ismail Khan	..	550	197 "	8·0 "	

Gunn notes that the damage done by the flood was not excessive, considering the huge mass of water liberated when the dam burst. He records that most of the damage was done between Tirit and Skardu, that the total cost of it in the Skardu *tahsil* was estimated

at under three lakhs of rupees (£22,500), and that on the whole river only forty-eight villages were affected. As far as I have been able to ascertain, there was only one life lost ; the son of the ferryman at Bunji was swept away and drowned while trying to retrieve driftwood from the flood.

In his report Gunn discusses the probability of the dam reforming and impounding another lake. This question is more in a glaciologist's sphere than in that of a hydraulic engineer. It is in fact of absorbing interest to the former. Gunn adduces, as evidence of his conclusion that the Chong Kumdan glacier is probably now in retreat, the behaviour of the adjacent glaciers, the Kichik Kumdan and the Aktash. These two glacier-snouts are known to have been recently retreating. It is, however, a fact that of two neighbouring glaciers, even when they have the same exposure, the snout of one may be advancing while that of the other retreats ; and there are even instances of *one side* of a glacier-snout advancing while the other retreats. The matter is decided mainly by the time taken for an excess or defect of snowfall above the snow-line to reach the snout, and with compound glaciers particularly, the conditions affecting the flow may be most complicated. In a recent investigation that I have made into the snout variation of thirty-four glaciers of the Karakoram region,* I have tried to explain the four components of snout-movement, viz., secular, periodic, seasonal and accidental, and I have given the various conditions which I believe enable one of these components to preponderate over the others.

Nor can the absence of detached pinnacles be regarded as evidence of advance when the snout is eroded by a powerful river. Creaks and "groans" near the snout either in winter or more particularly in summer are generally signs of advance, but here too when the glacier is holding up a great mass of water, these noises may be caused by the pressure of the impounded lake. A flattened blackened snout in summer or an upstanding white snout in winter are normal seasonal signs and cannot be brought as evidence. The absence of a terminal moraine is easily explained by the erosive power of a river issuing from or passing the snout.

The solution of the problem of whether the Chong Kumdan glacier will impound another lake is therefore not easy. It is, in my

* *The Glaciers of the Karakoram and its Neighbourhood*, under publication by the Geological Survey of India.

opinion, no use examining the adjacent glaciers ; it is a *personal* matter which concerns the Chong Kumdan itself.

The fact that the pressure of the glacier from the valley behind has been able to keep closed all crevasses in the portion of the glacier stretched across the Shyok valley is an argument that at least until recently the glacier has been trying to advance. The fact that when Gunn first examined the dam from the south side he saw neither an issuing stream due to percolation through the glacier, nor a terminal moraine, which must have been visible if there was no stream to carry it away, and if the glacier was in retreat ; the very fact that the dam did not break at the point of junction with the marble rocks, the radiation from which must tend to separate the ice from them at the first release of pressure ; and the appearance of the ice in his photographs prior to the burst ; these three factors all denote a tendency to advance. The dam did not burst until the level of the lake nearly reached the summit of the dam ; if the pressure on the opposite wall of the valley had been relaxed by retreat, I would have expected it to have burst before that height was reached. I do not therefore think that the arguments that Gunn puts forward are sufficient to conclude definitely that the glacier has begun to retreat.

The Chong Kumdan glacier is one where the periodic component is markedly predominant ; and it is fortunately one, as I explained in the last *Himalayan Journal*, where we have observations and deductions extending over a whole century. These observations indicate a periodicity, I believe, of approximately forty-five years. If the snout were not eroded by the Shyok river nor held up by the cliffs on the left bank of it, its years of maximum advance would be approximately 1839, 1884, and 1929. Examining the records of these years and the years near to them, we find floods due to the bursting of the Chong Kumdan dam occurred in the following years : 1835, 1839, 1842, 1926, 1929. About the year 1884 we have no actual records of floods ; but we know that in 1873 Colonel Gordon of the Forsyth Mission to Kashgar recorded that the Chong Kumdan “almost touched the opposite side of the valley,” and that for the next fifteen years we have no records of any traveller using the valley route. On enquiry from the Chief Engineer of the North-West Frontier Province, I learn that an abnormally high flood occurred at Attock between the 11th and 20th August, 1879, and another record flood occurred at that place on the 29th July, 1882. These two floods were higher than any others for several years before or after, and the second was actually higher than the Shyok flood at Attock this year by five feet. I feel

convinced that these two floods were caused by the bursting of the Shyok dam during the glacier's last period of advance.

From a study of the periodicity curve of the Chong Kumdan glacier and from the other factors noted above, I therefore come to the conclusion that the glacier is at its maximum periodic advance. It must, however, be remembered that in August surface ablation is at a maximum and therefore seasonal degeneration and seasonal retreat have weakened the glacier and magnified its weak spots. There was an abnormal heat wave for a few days prior to the burst. In my opinion the normal seasonal advance and regeneration in the coming winter will almost certainly close the narrow transverse channel that has been cut, and by next spring this should have completely healed. I believe that another lake will almost certainly form next spring, but since the seasonal retreat next summer will now be assisted by periodic retreat, the dam will definitely degenerate in height and strength. It may be that the lake so formed will drain away by percolation, or it may gradually wear away a channel, taking several days to drain (as happened in the last of a similar series with the Khurdopin glacier). If the healing is so complete as to prevent either of these two courses, I believe the dam will break again in August 1931, the month of maximum inflow to the lake, and the month of maximum degeneration of the ice. Under no circumstances can the dam impound a lake in the next few years of the same magnitude as that liberated in 1929. In my opinion there is no danger of a serious flood for many years to come, while the present danger of a complete block and of a minor flood will be over at latest in 1932, after which there will be nothing to worry about till 1969. There will then be an eight-year scare-period.

In Figure II, I have shown the periodicity curves for both the Kumdan glaciers, which, I hope, will illustrate my argument. The observations of the snout of the Kichik Kumdan are much less reliable than those of the Chong Kumdan, and its snout is much more subject to variable end-erosion by the river, and to accidental retreat (but not advance), owing to idiosyncrasies of the Chong Kumdan. I believe, however, that its period is also approximately forty-five years and that this period is entirely out of time with that of the Chong Kumdan, one being at its maximum advance when the other is approximately at its maximum retreat. There is only one recorded flood from the Kichik Kumdan, and it does not appear to have done much damage. This is accounted for by the fact that (to use Gunn's words) "the configuration of the country is such that even if it did impound a



Photo, F. Ludlow.

A CLOSE VIEW OF THE DAM THREE DAYS BEFORE IT BURST.

four-hundred foot depth of water, the volume of the lake would only be about one-third of the volume retained by the same depth at the Chong Kumdan."

Postscript.

Since going to press, Gunn, who is in England on leave, has kindly sent me the following comment on my paper: "I do not appear to have made myself quite clear in the report; the water never got within fifty to a hundred feet of the top of the dam at the lowest point, and was probably a hundred and fifty feet from the top at the point where it burst. The gradual increase of discharge was undoubtedly due to the opening increasing in some way—probably widening—and the sides falling in would account for the further noises heard by the Vissers. At the same time, on the 10th I heard a tremendous roar, but there was nothing visible at the dam to account for this when we saw it on the 12th. The size of the channel is only an estimate, and it was not actually surveyed.

"The variation in size of the flood rise is quite natural and depends on the available waterway, being much greater in gorges. The rise at Skardu is affected by the water being able to back up the Indus at the Indus-Shyok junction, which reduces the height but increases the duration of the flood.

"So far as I gathered, the total loss of life was one man at Deskit, who tried to rescue a pony, and eight women—three in one village and five in another—somewhere about Abdin, above Skardu."

The above statement that the dam burst before the water-level of the lake reached within fifty to a hundred feet of the top of the dam at the lowest point indicates, as Gunn suggests, that the snout has probably passed its position of maximum periodic advance. Periodic retreat however sets in very slowly and there is every chance of the winter advance counteracting the first tendency to retreat. It must also be remembered that the upper layers of glacier-ice are less compacted and therefore weaker than the lower ones, so that the break may have occurred along a line of weakness.

THE KAGAN VALLEY.

LIEUT. J. B. P. ANGWIN.

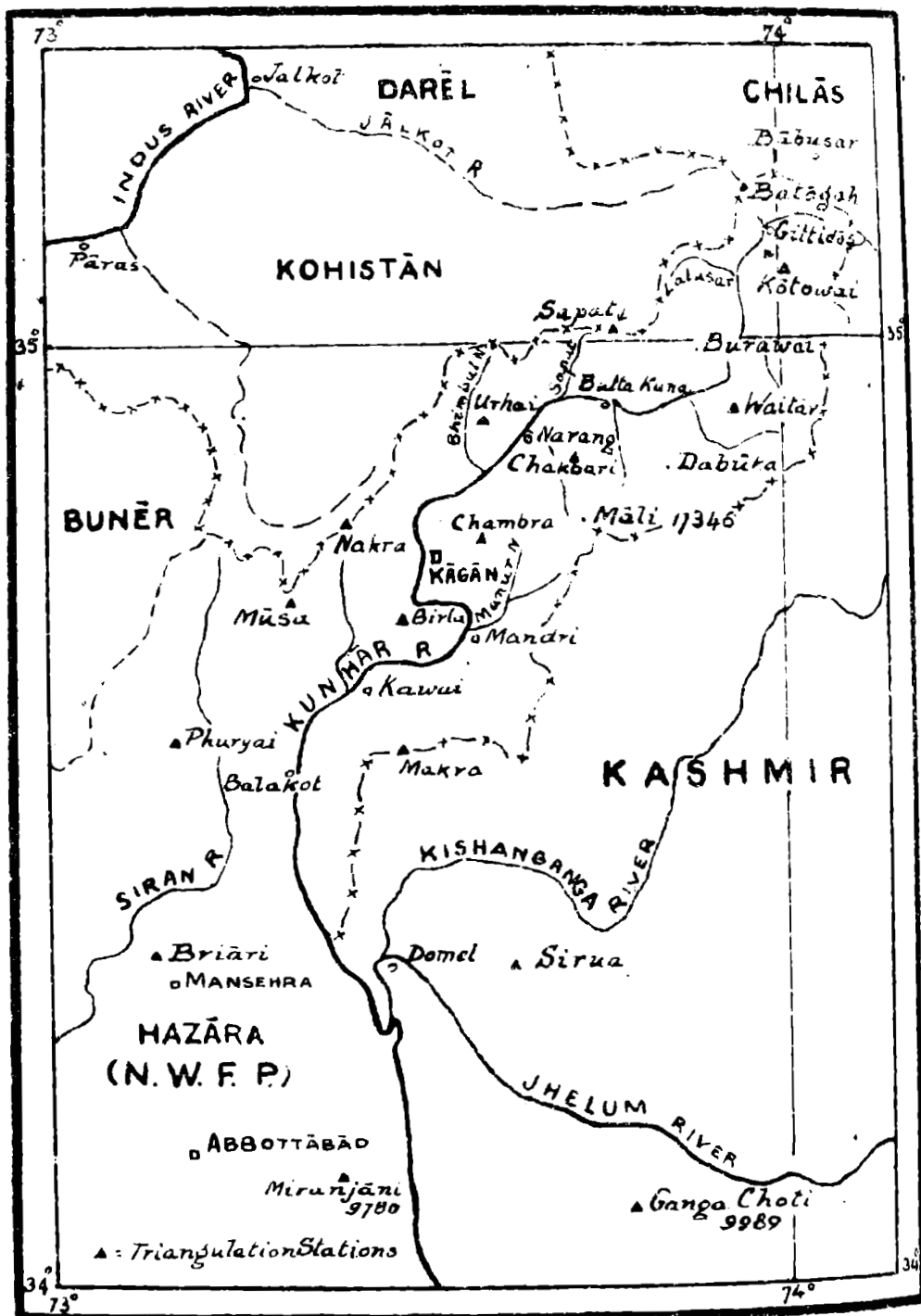
THIS account of a survey expedition into the Kagan valley will perhaps interest few members of the Himalayan Club who have penetrated the deeper recesses of the Himalaya. It may, however, appeal to those who seek fresh experiences, or who have not the leisure, the means, or the opportunity for more lengthy expeditions; for here, within two days' journey of Abbottabad, are to be found scenery equal to any in Kashmir, mountains for both the novice and expert Alpinist, and ground suitable for almost perfect ski-ing. For the shikari, however, there is nothing.

This mis-named minor valley—mis-named, for it is really the valley of the Kunhar river—lies between the Kishanganga valley of Kashmir, and the tribal territory south and east of the Indus. The main valley, about a hundred miles long, forms a well-known summer trade-route from Hazara to Chilas and Gilgit; the side valleys and the surrounding hills are, however, almost unknown.

General Bruce, in his *Twenty Years in the Himalaya*, has given a graphic description of some of his earliest mountaineering exploits among the peaks and passes enclosing the Manur tributary at the southern end of the valley and of his journeys up the main valley. Sir Aurel Stein has taken advantage of a beautiful and secluded camping-ground near Butta Kundi to write his memoirs, undisturbed. And latterly, in the autumn of 1928, Captain D'Arcy and Lieut. Daunt, of the Royal Artillery, made an unsuccessful attempt to climb Mali, the highest peak of this region. Apart from these journeys and the survey visits of long ago, I can find no record of any exploration into the side valleys.*

In the summer of 1926 I was fortunate in being detailed to carry out the triangulation of the whole valley, in order to fix points for a subsequent topographical survey. I had no previous experience of mountain climbing and there was little time to make preparations for

* In June and July 1911, Captain O. E. Todd did some interesting exploration and made two attempts to climb Mali, by the east face and by the north-east arête (*Alpine Journal*, Vol. 26, p. 201).—ED.



THE KAGAN VALLEY

Scale 1:1,000,000
 Miles 10 5 0 10 20 Miles

a five-months' stay in the high hills. Provided, however, with some invaluable hints and an ice-axe by "Ganpat," with all available information from the local Political and Forest Officers, and with a supply of tinned provisions, I started from Rawalpindi at the end of April.

The chain of triangles was to be commenced from the existing survey stations of Ganga Choti (9989 feet) and Miranjani (9780 feet), carried across the Jhelum and Kishanganga valleys to the Kagan border and then across and up the valley. I hoped also to obtain permission to cross the northern border into the Indus Kohistan.

My first move was to Mansehra in the Hazara district, where arrangements had been made for supplies. Here I met the Assistant Commissioner, Mr. A. W. Fagan, I.C.S., to whom I am much indebted for generous hospitality and assistance then and later.

After completing preliminary arrangements I crossed the Kishanganga by motor to Domel in Kashmir on 29th April. From here we proceeded up the Kishanganga valley to a camp at about 10,000 feet just below the snow-line, on the southern slope of Makra (12,744 feet), an old survey station on the Kashmir-Kagan boundary, which I had selected as one of my probable stations of observation. Ignorant as I was of snow-craft, I was somewhat shy of the remaining two thousand feet to the summit. A month later I would have scorned to proceed with the caution that characterized my first ascent, but I was only learning, and was responsible for the safety of some twenty or thirty men, so *khazardar* was the watchword. The ascent was over snow, steep in places, but more arduous than difficult. Near the summit we discovered a large cairn almost buried in snow, apparently several yards south-west of the highest point. It was, however, actually on the summit of the hill, as we found by digging; and the cairn was merely screened from the north by a cornice which almost completely shut out the view into the Kagan valley. It was obvious that later in the year this cornice would be reduced in size, and that this site would be the best point on the boundary for linking up the chain.

The following day, after a very trying twenty-four-mile march with three changes of transport and a passage through the Kishanganga gorge in the dark, we arrived back at Domel at 10 p.m. soaked to the skin. Meanwhile my assistants had fixed opaque signals on Miranjani and Sirua (10,444 feet) in the Kashmir hills north of the Jhelum.

At Domel there were further transport difficulties, but eventually, with the help of Raja Natullah Khan of Sanmia, I moved a small camp to Sudhnu Gali, near Ganga Choti on the Kashmir-Punch

boundary. This ancient *jagirdar*, Natullah Khan, was a delightful man, full of reminiscences of "Nikalsain Sahib"—stories doubtless handed down by his father, and so mixed up with his own experiences that he had annexed them as his own.

In this camp we remained in the vilest weather, and it was not until the third evening that I yielded to the persuasion of local inhabitants and sacrificed a goat to the weather god of Ganga Choti. I was told that all sahibs are anathema to this deity; obviously, therefore, something had to be done about it, and I turned pagan for the moment, with the result that the fourth day dawned bright and clear.

A three days' march now took us to Sirua where, after two days of almost unceasing mist and rain in camp some five hundred feet below the top, I moved a small party to the summit in order to observe immediately the weather turned fine. But it remained miserably unsettled and it was a further week before my observations were completed.

On this hill I first experienced the electrical storms which proved later to be such a feature of this part of the Himalaya. It was here that, whilst sitting at table in my tent, I was knocked over backwards by a blow on the forehead; while a little later I was lying on my bed reading, when there was a bang and I received a tap on the knee—possibly a gentle hint that the god of Sirua would also have appreciated a goat!

The move across into the Kagan valley, including observations at Miranjani, Briari (4684 feet) and Phuryai (8158 feet) was uneventful, except that on Miranjani the whole camp was wrecked by a hurricane which raged throughout one night. Much delayed by bad weather, it was not till 7th June that I arrived with a small camp at a *gali* on the south-west spur of Musa ka Masala (13,374 feet), a hill at the head of the Siran-Kunhar watershed. This hill is clearly visible from Mansehra, about thirty miles to the north-east, and when snow-covered is a most attractive sight.

The local inhabitants endeavoured to dissuade me from going up the hill, saying that it was dangerously near the routes used by cattle-raiders from tribal territory. A more probable reason for this attitude was that the hill is looked upon as sacred. A *ziarat* crowns the summit, but was not visible at that time as the snow was from ten to fifteen feet deep; though later in the summer its rough stone walls, festooned with flags, are seen surrounded by scores of low columns, built of flat stones, each testifying to the sacrifice of a goat.

The ascent of this hill presents no difficulty from the south-west or even from the south-east spur, as we discovered later. The summit is a ridge about three hundred yards long and almost level. In the search for signs of a previous survey signal some of us were foolish enough to remove our dark glasses for a few minutes. The results were a mild but painful attack of snow-blindness, and an enforced holiday next day.

Transport difficulties spoilt the enjoyment of our next move into the main Kagan valley, but there was compensation in a delightful camp at Chor Gali, just east of Birla station (9750 feet), where a day was spent in reconnaissance before pushing on to Kagan village.

Below Kagan the valley is enclosed by steep slopes, thickly forested at intervals, and it is not before Narang, one stage above Kagan, that the main valley begins to open out. From just below Kagan village there is a beautiful view up the valley, disclosing the black rock peak of Nakra (15,056 feet), prominent amid the snows. There are finer views further up, but this particular one struck me forcibly, for I knew that Nakra would have to be one of my stations, and it looked a very devil.

We spent two days at Kagan resting, making arrangements for supplies and endeavouring to get the *Sayyids* down to hard facts. These *Sayyids* are the land-owners of Kagan, a fine race once, but now sadly degenerated through inter-marriage and multi-partition of hereditary lands. Their influence is alleged to be great; in practice it is almost nil. They still command some respect among their own villagers, but they were able to collect hardly a cooly, and the few who were enlisted bolted at the first opportunity. Later on, one of them, Sayyid Lizzat Shah, accompanied me for several days, always ready with offers of assistance, which seldom materialized. He was, however, a pleasing personality with a fund of interesting conversation, which to some extent counterbalanced his deficiencies as a provider of *begari* labour.

From Kagan I wished to make a reconnaissance, on consecutive days, to Sirul (13,515 feet) and Chambra (15,344 feet). Sirul was easy, but was unsuitable for a survey station, and, from below, the route to Chambra looked easy too. Actually it proved impossible for laden coolies, being up and down a razor-edged ridge about two miles long, with an eave to the north. It took us two and a half hours to march to a *gali* about a quarter of a mile along the ridge, and a further three hours to descend, via an unpleasant couloir,

which bore traces of frequent stone and snow avalanches, to a suitable camp-site, which we reached after dark.

From Sirul I had spotted a possible site for a base-camp for Chambra on a stony plateau, and the following morning after a very early start we reached it at 7 a.m., to find a camp already there, occupied by my commanding officer, Captain Norman, R.E., and his wife. He had come up on an inspection tour and had arrived late the previous night, having had trouble in getting coolies.

After breakfasting with them I set off with a small party to reconnoitre Chambra. The route is not difficult and at this season (mid-June) the crevasses on the small glacier about a thousand feet below the summit were easily visible. I left most of the party at a small *gali* just above the glacier. Here I saw tracks of red bear, so slung my rifle and, accompanied by my recorder Fazal Ellahi, Lizzat Shah and a khalasi, Muhammad Ismail, ascended the last few hundred feet of steep frozen snow. Steps had to be cut almost the whole way. The final ridge is nearly level for about a hundred yards, sloping up to the summit at the east. On the north a sheer cliff descends to the glacier, while the south face is a precipitous snow slope.

I was leading on the rope and Fazal Ellahi was last. Barely had we arrived at the summit when a storm broke. I immediately gave orders to retreat. The atmosphere was alive. We had not gone twenty yards before Fazal Ellahi was knocked down, and Lizzat Shah's ice-axe was struck out of his hand and went hurtling down the *khud*. My own rifle hummed like a tuning-fork and I nearly threw it away.

Fazal Ellahi sat rubbing his head. He got up and we moved on once more in the blinding hail. Again within twenty yards he was knocked over, but got up unhurt. We were between the devil and the deep sea. To move fast was to court disaster; the only course was to go slow and hope for the best. At length we got down to the *gali*, but for long after we had collected the others and started back to camp the storm continued and lightning flickered round.

On steep snow slopes it was my rule to have one rope for every twelve men, made fast to a man at each end, and with the men in the middle always holding on with one hand. This was as much to prevent straggling as for any other reason, but on this occasion it proved our salvation. I moved Fazal Ellahi back, next to me. He was reeling like a drunken man. I thought we should never get him down the remaining four thousand feet, but he stuck to it like a Trojan, and when at last we arrived, he was on the point of collapse. He was

put to bed and dosed with aspirin and hot milk, and in two days was fit for work again.

The day following this experience we fixed a signal post on Chambra, though thick mist prevented a proper reconnaissance.

A pleasant march, with some angling for snow trout on the way, took us from Kagan to Narang, from which place Norman and I attempted to find a way up Urhai (14,552 feet), but we only spotted a practicable route too late to make the ascent. Accordingly, the following day we moved camp across the river to Sukha Singal, and I reached the top, though a biting wind and driving mist made a stay of more than a few minutes impossible.

Mrs. Norman insisted on accompanying us next morning and made the climb of about 3500 feet in three hours, a remarkable performance for a woman on her first climb in the high hills.

Descending once more into the main valley we moved to Butta Kundi, from which place we tried to find a way up the hill shown on the map (43 F/NE) as Safr Maluk Sar. The local inhabitants said that there was no hill of that name, and if there was one, there was no way up it! This, from what we could see of the hill we meant, seemed to be true, so after bidding good-bye to the Normans, who were returning to civilization, I visited a hill further north on the same ridge, which divides the Dhadr Nala from the Safr Maluk Nala. This hill, subsequently named Chakbari Nar, after the Gujars' encampment at its base, overlooks the lake of Safr Maluk Sar. This lake is alleged to be the home of a sometime fairy princess, who fell in love with a mortal from the Punjab, and, marrying him against her father's wish, was banished to the depths of the lake for evermore. I was unlucky enough to see no princess, and the hill itself is far from romantic. It has an unpleasant habit of throwing stones at all times of the day and night. There was an almost continuous succession of stone-avalanches from all sides, both at this time and later in the year, and we had some narrow escapes. I should not be surprised to hear at any time that the whole hill had slipped bodily into the stream below.

From Chakbari Nar a two-days' march took us to a very pleasant camp-site, just below the snows at the head of the Sapat Nala, and from Sapat station (15,512 feet) I had my first view of Kohistan, at that season of the year a bleak and unprepossessing country, but with promise of good grazing later.

I now wished to march by a back-door route to Gittidas, at the head of the main valley, but having crossed one pass of about 14,200 feet, the coolies refused to cross another into the Lalusar Nala, and

we were forced to turn down the Bas Nala to Burawai, in the main valley, whence a long march brought us to Gittidas. Here the valley, which is occasionally visited by predatory Kohistanis, opens out into a wide rolling basin, a veritable *pamir*, and a skier's paradise.

While my men rested from their exertions, I went on into Chilas to see Searle, the Assistant Political Agent, who was at Babusar rest-house, a few miles beyond the pass. I had by then a month's growth of beard and fully merited my bearer's *Ap padri sahib hogaye*; I must have presented an astonishing sight to Searle when I arrived unheralded at the bungalow. However, he took me at better than my face value and was most hospitable.

I spent the night with him on the condition that he would return with me, and on the following morning we set off for Botogah (14,830 feet) a hill on the Kohistan boundary, which I wanted to visit *en route*. It was an arduous journey and by the time we arrived there was barely time for a short look round before we had to leave. Even so we were benighted and had to ford the Loi Halol Nala in the dark, clinging hand to hand, up to our waists in the icy water, which was rushing down with such force that we were nearly swept away. But for the Chilasi *lambardar*, Yakiah, who had received an S. O. S. from my camp and who came in search of us with flares, we must have spent the night in the open, for it was pitch dark and neither of us knew the route. As it was, we arrived in camp about 10 p.m. and ate a colossal meal, washed down with copious draughts of hot tea and whisky.

Botogah is an extraordinary hill which appears to be composed entirely of huge, loose disconnected rocks. The snow water could be heard trickling far down in the centre of it.

On the way to Kotowai station (15,226 feet) an incident occurred which nearly put an end to me. At about 14,000 feet a small bird got up and I discovered a nest containing three eggs in a tuft of grass under some overhanging snow. Small birds are rare in Kagan at this altitude, and full of new-born ornithological zeal I took an egg and put it in my mouth for safe keeping. We were not roped and a little further on I suddenly slipped and shot off down a steep snow slope. Fortunately I kept hold of my ice-axe, and, using this as a brake, eventually stopped myself about two hundred feet down, just above an unpleasant rock fall. It was only after regaining the crest that I remembered the egg. But it was too late. Not even the shell remained!

Only two hills now remained to be reconnoitred; Waitar (15,217 feet), some distance down-stream on the left bank, and Nakra (15,048 feet), the rock peak previously seen from below Kagan.

The ascent of Waitar can only be made, by a laden party, from the north-east, as on the other flanks it is almost sheer cliff. Even on the north-east the rocks are steep and rotten. An ascent without loads might however be made from the Jora Nala to the south-west. There are several delightful little rock-bound lakes in the bed of the nullah running down to the main river and from the summit there are some magnificent views. The rugged peaks of the Burawai group lie to the north, and to the south and south-west are Dabuka and a mass of quaintly-shaped peaks near the Kashmir boundary.

From Waitar it is two long marches to Seh, a good camp-site on a spur running south-east from the Kohistan boundary east of Nakra; and from Seh to Nakra it is a hard three-hours' climb, but until the last few hundred feet the ascent is not as difficult as it appears from below. The summit is practically sheer cliff on all sides except the north-east, and is divided into two portions, each about thirty yards long and fifteen feet wide, by a "waist" some four feet long, not more than a foot wide, and four feet below the general level of the rest. It was a hair-raising performance getting across until we had a rope in position, and even then some men could not be persuaded to cross. They were fortunate.

Owing to the difficult nature of the hill, servants' tents had been brought up for a small camp, as I wished to observe at once, all the other stations having been marked already. My tent was pitched on the top a few yards away from the station, and the men were on a ledge about twenty feet below, on the Kohistan side.

On the following morning mist soon prevented observation and a storm gathered black over Kohistan. Just before midday the theodolite, which was in position over the mark, began to hum. With some diffidence I dismantled it, getting slight shocks, and had everything put into my tent. The other tents had already been taken down. There was no time to lose. I ordered everyone under cover, using the tents as tarpaulins. Within ten minutes everything and all the men were away except Naran Shah, my Khattak orderly; it would have taken half an hour at least to clear everything from the summit.

The electricity could now be felt. I could hear my orderly's peaked *kullah* fizzing. My whole body tingled, and the hair on my spine stood on end. I sent Naran Shah off the summit and crawled into my tent. Surrounded by instruments, I expected the worst

and hoped for the best. At first there was silence, except for the crackling from each tent-pole and the rumbling of distant thunder. Then the storm, accompanied by shattering hail, burst right overhead. About one o'clock I received three blows in rapid succession, on the finger, knee and back of the head. Then I decided that discretion was the better part of valour and slunk between my blankets trying to compress myself into nothing, with mixed thoughts of heaven, hell and a problematical home leave.

Two hours later the storm cleared. I found that one man only, one of my best men, had been struck on the leg and burnt. Why he was selected is a mystery, as he was wedged in among the others under a tarpaulin, like a sardine in a tin. The injury was not severe, but for some days he was quite useless and he eventually had to be discharged.

After the storm the air was beautifully clear and I was able to observe until about four o'clock. But the nerve of the party was shaken, and, deeming it wiser to avoid another night on the hill, I decided to return to Narang and to come back to Nakra at some later date.

At Narang we found Fagan, the Assistant Commissioner, and Hodder, of the Frontier Constabulary, who had come up to hold a *jirga* with the Jalkotis and to make arrangements for my party to enter their country. It was now 19th July and even if we succeeded in getting their support, it was rather late in the season, but I was very anxious to get into Kohistan, a country which has never been explored or mapped, and which is utterly unknown except for itineraries obtained by the Intelligence Department. We had hoped to get the *jirga* in a month earlier, but the snows were late and they could not be persuaded to come. At last they promised to be at Narang on the 17th. By the 21st they had not appeared, and as I could not afford to waste time, I left Fagan and Hodder to deal with them and moved off down-stream with the object of commencing observations at Makra and working up the valley, peak by peak.

After five days of abominable weather at Makra, it was apparent that we were getting a taste of the monsoon and that observations there would be impossible for some time. It was therefore decided to reverse the programme and go right to the head of the valley, where clearer weather was likely, and to work back.

On our return to Kawai we found Fagan and Hodder, who had at last held the *jirga*. The result was disappointing. About eighty *maliks* had come in and after much discussion had decided that they

themselves would have no objection to a survey, but that each must refer the matter to his village before giving permission and a promise to aid and protect. They had now returned across the border, undertaking to send a reply within a fortnight. Nothing more was heard from them, although later it proved that in any case there would have been no time to spare. Kohistan is troubled by inter-village disputes and there is no central authority. The inhabitants are of a cheerful appearance which belies their quarrelsome disposition. They must be among the dirtiest people on earth. Fagan puts it elegantly when he says that one Kohistani smells like a concentrated herd of goats. At the *jirga*, when cigarettes were produced, they broke into cries of *Chilam*, and, on being given some tobacco, made a little pile of mud on the ground, bored a hole through it horizontally, filled one end with tobacco and lay on their bellies, one after the other in rapid succession sucking with every appearance of enjoyment!

Even at the head of the valley the weather was unsettled and it was a week before the observations from Kotowai and Botogah were completed. The camp on Botogah had little to recommend it as regards comfort, but as a view-point it was marvellous. Eastwards the grassy downs of Gittidas, overshadowed by Nanga Parbat, a shimmering opal at sunset, dark and forbidding at dawn; to the west a serrated line of fantastic peaks and ever-changing shadows.

At Botogah I was awakened in the middle of the night by a *khalasi* who had come up in the dark from the supply camp, some two thousand feet below, to report the capture of three Kohistanis who had attempted to loot the camp. I was a little terse at being disturbed and I am afraid I did not at the time give him due credit for a really stout effort. I eventually handed over the prisoners to the Chilasi *lambardar* for treatment, but they got their own back later by wrecking my signal on Botogah after we had left. Fortunately the men whom I sent back to re-erect it, travelled direct across country with such speed that work was hardly delayed at all.

Four days in a tiny camp on Waitar, a week of damp discomfort surrounded by swirling mists on Sapat, and three days at Chakbari Nar were occupied in taking observations, and we arrived at Urhai on 28th August.

Urhai is a stony round-topped hill on which there is plenty of room for a small camp and for once I was able to use a forty-pound tent. For five days misty weather prevailed and I was getting bored to tears, waiting for the brief breaks when observation was possible. At about four o'clock on 2nd September I was sitting gloomily on my

bed, listening to a fierce hail-storm pattering on the roof and wondering what on earth to do. Suddenly there was a flash across the tent, a bang—and I found myself lying on the bed. There was a smell of burning flesh. My left heel was in agony; both legs were throbbing and felt like bursting. I reached down and felt myself. On my left heel there was a hard lump the size of an egg, two burns on my right calf and another on my buttock.

I lay there for about half an hour until the storm ceased, visions of a pale-faced paralytic being carried into Mansehra crossing my mind. Then I yelled for my bearer, who came and tended the burns with ointment. His distressful "My Gods" were almost as disturbing as the storm. His English is limited, but picturesque. By six o'clock I found that I was not paralysed after all, and could hobble about. It cleared up beautifully and I was able to complete the observations in the hour and a half before dark. I found later that there was nothing left of my shaving mirror but a few fragments, and there was a neat hole about the diameter of a pencil burnt right through my bed and bedding.

It took two days to get back to Kagan as I could barely walk, riding was equally painful, and lying across the saddle is neither dignified nor comfortable. There I lay up in the rest-house for nearly a week spending part of the time making a dhooly out of the scanty materials available.

On the 10th we started for Chambra. The dhooly proved a ghastly and uncomfortable failure and almost impossible to carry up the steep hills, so it had to be left. It took three days to get to the top and now that the deep snow had gone, it was ticklish work clambering up the huge loose rocks of which the south slope is composed.

The observations were completed in two days, but during the night there was a fresh fall of snow and it was still snowing in the morning. Fortunately the coolies arrived about 3 p.m. having, as I discovered later, narrowly escaped disaster in a crevasse whilst crossing the glacier in the mist and driving snow. The march down over loose rocks, partly covered by new snow, was a nightmare, and it was a relief to reach camp on a small plateau at the foot of the final slope.

After a day's rest at Kagan we again attacked Nakra, this time with more success, as although the fresh snow added to the difficulties of the climb, there was almost perfect weather, and observations were completed in a single day. Only four stations now remained: Birla, Makra, Musa and Phuryai; and I was anxious to get back, as the burns of three weeks ago refused to heal.

At Birla I had my last experience of lightning that year—rather an amusing one. This hill is on the end of a long low spur and lies roughly at the centre of a circle of much higher hills. One evening there was a furious storm moving round the circle, but it did not worry me much as I thought it unlikely to leave the heights. I had developed the habit of subconsciously counting the seconds between the flash and the thunder and had just got into my bath, when I realized that the storm was coming down the spur! A dry man was probably safer than a wet one, so I leapt out, and drying myself as well as possible with a damp towel, dressed. Then without thinking, I blew my nose loudly. This was always the signal for dinner, and my bearer appeared at once with food.

I hated the thought of it at the moment but had to get through dinner with a calmness I was far from feeling, under the eye of my admirable bearer, who throughout the season had appeared entirely unconcerned at thunderstorms, or indeed at any of the difficulties and discomforts we had met. I bolted my food with the utmost speed and packed him off to his tent with orders not to move till the storm was over, what time I crawled into bed in a blue funk. And nothing happened!

Apart from spending my birthday on Makra nearly perishing with cold in a semi-blizzard, the three remaining hills were completed without incident, and we returned to Mansehra on 2nd October.

In conclusion, a few notes on the possibilities of the Kagan valley as an inexpensive playground for members of the Himalayan Club may not be amiss.

The peak of Mali and the groups of Burawai, Dabuka and Damdama provide ample scope for any climber. Although none of the peaks, with the exception of Mali, is much over 16,000 feet, and the Damdama group is only about 14,000 feet, there is almost every type of climbing to be had.

A very good ski-ing camp could be made on the northern slope of Makra, with the rest-house at Kawai, one march up from Balakot, as a base. Runs of four to five miles of varying slope should be easily obtainable about Christmas time. There is a village with a good water supply at about 8000 feet, on the spur almost due north of Makra, and of course firewood abounds.

Runs of about eight miles would be found between the Kashmir border and Gittidas (11,930 feet) at the head of the valley, but special arrangements would have to be made for transport and supplies and there is no firewood within many miles south of the Babusar pass

There is, however, forest just across the pass in Chilas, and there should be no insuperable difficulties in planning a delightful skiing camp.

The possibilities are well worth investigating, but as I had done no skiing in 1926 I did not examine the country from a skier's point of view.

Yaks are not available, and mules should be used for transport. I hired about forty mules from Balakot, as permanent transport, and they did magnificent work. On occasions, when the coolies failed, I took them to over 14,000 feet across the roughest country. They would be quite capable of getting up to Gittidas in winter, along ski tracks. Forage would have to be taken or dumped previously, at the various rest-houses *en route*.

SONAMARG AS A CLIMBING CENTRE.

DR. E. F. NEVE.

INTEREST is doubtless centred on those districts to the north of Kashmir, the exact topography of which still calls for elucidation. But to those whose circumstances limit their opportunities for distant travel and exploration there are many parts of Kashmir proper which can provide much interest and enjoyment to the traveller, the scientist and to the Alpine climber. Sonamarg, for instance, is so situated as to be an excellent base for both tours and climbs. Within easy reach are a score of peaks which have never been ascended and upon which attempts should afford real pleasure.*

Even the approach to Sonamarg by the Sind valley is most impressive. The pony-track runs along the side of the river, sometimes by the water's edge, at others crossing precipitous spurs. Right and left the grey cliffs tower up, in tiers, to a height of five to eight thousand feet above the river, which, during the melting of the snows, is a mighty torrent, descending in foaming rapids, intensified by the rocky walls between which it is pent. There can be but few places in the world where there is an almost vertical rise of one and a half miles sheer above a river.

As we emerge from the Gagangiyer gorge, the beautiful glacier valley, the Thajiwas Nar, comes into view. Sonamarg is an immense moraine fan at the entrance to this valley, and four hundred feet above the Sind river. The *marg* consists of a series of crescent-shaped terraces and ridges, the outer of which are nearly a mile across. These are the successive terminal moraines of the immense glacier which once filled the Thajiwas valley above. Between the curved ridges there are now grassy meadows, spangled with Alpine flowers. Sonamarg may have derived its name from the sheets of golden ragwort, the widespread orange-coloured wild wall-flower, or the troops of yellow mullein. But many of the slopes are brilliant with pink balsam

* The best general maps of the whole area described are the Survey of India half-inch maps 43 J/SE and 43 N/SW. For climbs, the maps on the one-inch scale are more detailed.—ED.

or gloriously blue with forget-me-nots and other varieties of the *boraginæ*. The glacier stream falls in tumultuous rapids and cataracts to join the Sind river just below the Shitkari bridge. The steep hill-sides are clothed with magnificent Himalayan spruce, some of which attain a height of a hundred and fifty feet. The swiftly-rushing stream is overhung by grey rock, half masked by moss and ferns, jutting through the dark masses of firs. Above, the crests are clothed with birch, with here and there a clinging bush of pink rhododendron.

At the entrance to the glacier valley, in the angle between the gorge of the Sind valley and the defile down which the glacier stream plunges with deafening roar to join it, is one of the most impressive pieces of mountain scenery, not only in Kashmir, but in the world. Seven thousand feet above the marg, on the opposite side of the torrent, rises a line of bold peaks, whose jagged arêtes and sheer precipices drop down on either side. These embrace, in their steep hollows, four extensive glaciers, the lower ice-falls of which are three thousand feet above the stream. The glacier valley is under snow until summer is far advanced, and often with a crash and a roar the ice-cliffs above topple over and a stream of great blocks rolls down the precipitous slopes. When the sun is shining warmly, these slopes are raked by falling stones and rocks set free by the melting of the ice above, while great areas below are strewn with the trunks of trees and other forest debris brought down by the recurring winter avalanches. It is possible to climb on to the glaciers and to explore the deep crevasses with their blue cliffs and towering seracs. But care has to be exercised if descent into the icy caverns is contemplated, as, owing to the sun heat, disintegration is constantly going on and immense fragments subside and often fall into the chasms and fissures.

From Sonamarg there is a fine view of the Sirbal peak (17,178 feet). As the crow flies it is only six miles away. Descending from the marg and crossing the bridge at the village, a march of four miles up the Baltal road brings us to a charming little pine-forest with a stream flowing down a narrow valley on the left. Turning up this, which is known as the Kokurun Nar, and ascending steadily for three miles, we reach an open space with a large cave in the cliffs facing us; and up above we see the glaciers and ice-falls of the Sirbal peak. A camp might be placed here and an attempt made to climb the peak, the ascent of which would be most interesting.*

* Survey of India one-inch map 43 N/7.

Baltal, at the head of the Sind valley, is well known as one of the stages on the road to Leh. From here it is just nine miles up the gorge to the south to the cave of Amarnath. Until the end of July the route lies over the snow which bridges the torrent. From the cave there is an interesting route over the mountains to the Zoji La. Leaving the cave on our left, we ascend steeply to the north for two thousand feet, reaching by the Seki Pantsal pass (15,263 feet), an extensive snow-field which stretches away to the east, where it culminates in the Machoi peak (17,904 feet), the snout of whose northern glacier lies just above the Machoi (or Mitsahoi) hut, the first stage beyond Baltal. The ascent of this peak would be attractive to the climber. To reach the Zoji La, however, we turn down a valley which descends sharply for about four thousand feet to the pass. This valley lies between Kainpathar Nar and the lesser Gumbur Nala.* The Kainpathar Nar itself is also well worth exploring. Its entrance upon the Zoji is marked by a small waterfall. Following up this little stream, which is usually under snow, we come to the Amarnath glacier cirque, with the peak (17,290 feet) facing us in all its majesty. We are now about 13,000 feet above sea-level, and a climb south-east by east for two thousand feet brings us to the northern arête of the peak, which has never been climbed. It is possible that by camping here the summit might be reached the next day by following the arête. From this camp-site we overlook the steep little valley down which the route from the Amarnath cave passes to the Zoji La, and look right down on to the ice-falls at its head.

Between Baltal and Sonamarg, and on the left side of the Sind river, is the Saribal Nala, a beautiful, narrow, steep little valley, which, after a climb of five miles and an ascent of five thousand feet along Durin Nar and Nila Nag, and past two charming sapphire-coloured tarns, brings us to the summit of a pass (14,422 feet), overlooking the Kolahoi glaciers and the source of the Lidar river.† The northern cliffs of Kolahoi face us across the valley. A steep descent of three thousand feet brings us to the snout of its northern glacier. Owing to the very difficult ice-falls of this glacier, the best route to

* The best maps of this area are one-inch sheets 43 N/7 and N/11, 43 N/8 and 43 N/12. Unfortunately the area is at the corner of these four, the one-inch survey was only taken to the watershed, and the quarter-inch map, compiled from old material, is incorrect. A careful sketch of this ground east of the watershed is required. The Kainpathar Nar is correctly shown on the map.—ED.

† Map 43 N/8 on the one-inch scale shows the Kolahoi regions.

ascend it is by crossing the Lidar river and climbing the left lateral moraine for about two thousand feet to a point beyond the first two ice-falls. The scenery is charming; bushes of pink rhododendron and sparkling patches of *primula rosea*, surmounted by cliffs clothed with birch, gradually give place to snow-covered slopes. Sometimes here the phenomenon of red snow is noticeable, far away from the possibility of coloration by red rocks, of which indeed there are none in the immediate vicinity.

Above the second ice-fall is an ice-field, to the south of which stands the pyramid peak of Kolahoi, rising five thousand feet from the ice. From this point two arêtes can be seen—the eastern and the northern; and on the west a rib runs down steeply. The northern glacier descends from the east of the peak.

The colour of Kolahoi is dark grey; the strike north-west. The rock formation is extraordinarily stable. On the great snow-field there is no rocky debris, but at the foot of the eastern arête there is a collection of small rocks and shaley detritus. To the north and west the glaciers are wonderfully free of rocks; and where these exist they are small. The fragments are polymorphous, many of them with sharp edges and extremely hard, giving a metallic ring if struck. Some are basalt; most are trap. Purple, pale jade-green, and dark grey are the commonest colours, with here and there a reddish-brown mass stained with iron. Few of the moraine blocks exceed twenty cubic feet in size and there is evidently very little disintegration taking place. Doubtless the extreme steepness of the sides keeps the rocks dry and saves them from the influence of freezing and melting snow. Kolahoi peak in its stability presents a marked contrast to the cliffs on the right bank of the Lidar a few miles lower down, where massive rocks have fallen in abundance.

To the west of the peak is another glacier, which, so far as I am aware, has never been described.* This glacier, near its junction

* While surveying in this area I traversed this western glacier of Kolahoi on 16th August 1912, and crossing the pass at its head, descended to the glacier cirque of Katar Nag, which drains into a nullah leading to Arau. The Blue Poppy (*Meconopsis Aculeata*) grows in this nullah abundantly. I believe that this was the first time that the western glacier was traversed and the first time the Katar Nag was visited by Europeans. Neither glacier nor nullah were shown on the old map prior to the surveys of 1912. The crevasses were open and somewhat difficult. A short account of the glacier appeared in the *Pioneer* of 20th August 1913.—Ed.

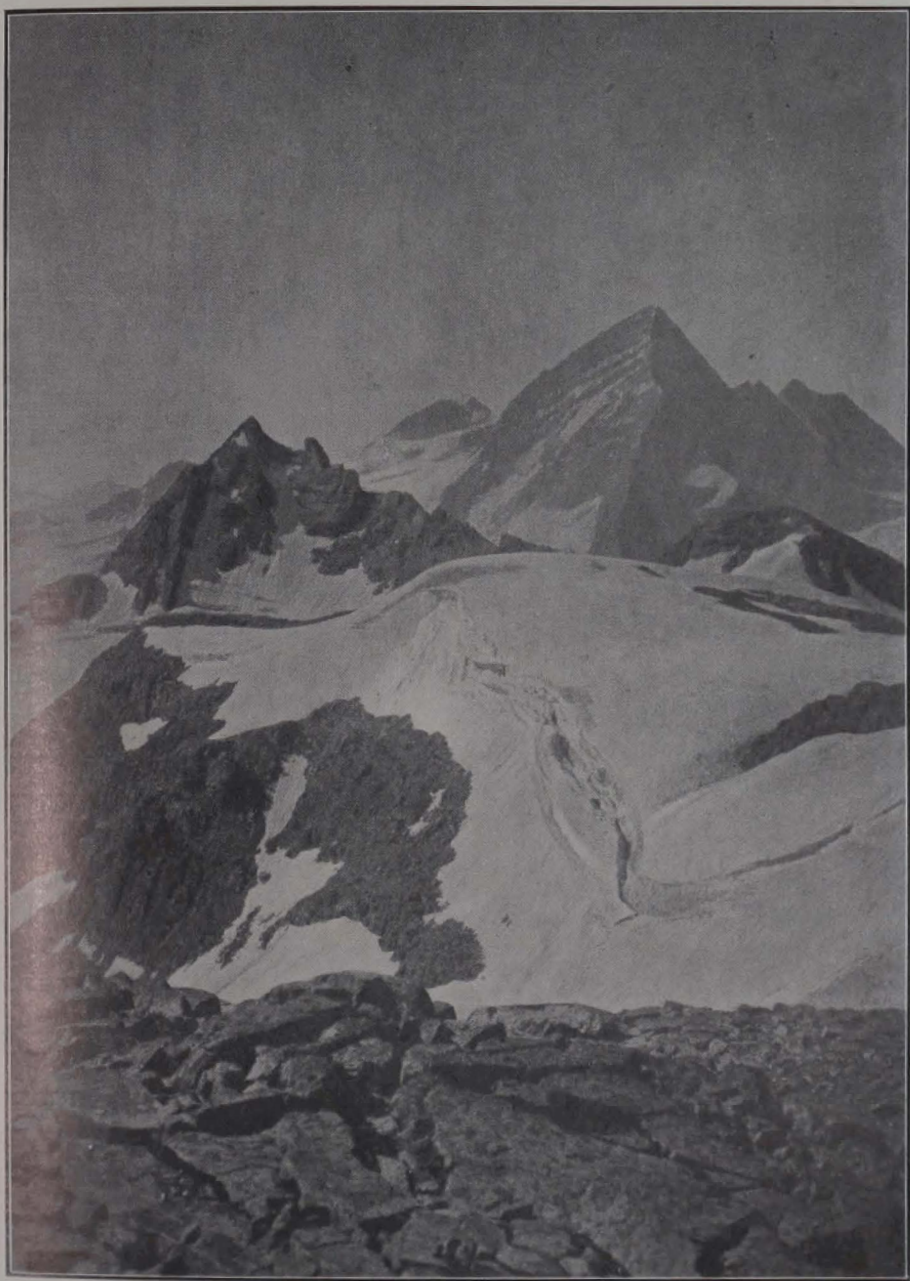


Photo. E. F. Neve.

VIEW FROM HEAD OF THAJIWAS NALA ABOVE SONAMARG.
KOLAHOI (17,799 FT.) IN THE DISTANCE.

with the north glacier is about one-third of a mile across. It is considerably longer than the north glacier, but much less steep. Above the junction it has two ice-falls, and it is bounded on the west by a ridge with an outstanding peak (16,250 feet). The width at this point is about half a mile. When there has been a heavy winter snowfall, the crevasses of the lower, and the seracs of the upper ice-fall are easily passable. Above the upper one is a snow-field, about a mile long, completely isolating the Kolahoi massif from all the mountain ridges to the west. The snow extends southwards to a pass which leads to the wonderful little glacier cirque of Katar Nag, with its seven little emerald lakes, a mile and a half below. From the pass the snow extends to the great snow-field which stretches round Kolahoi from south to east, and covers an area of four square miles at an altitude of about 15,500 feet. It was from this snow-field that the first ascent of the peak was made in 1912 by Major Kenneth Mason and the writer. The west side of the peak is most impressive. It stands up four thousand feet from the glacier, with extremely steep couloirs, fissured with bergschrunds. The south arête is jagged and peaked, the angles being filled with corniced snow. The axis of the peak is from south to north with an inclination of ten degrees to the east. Its height is 17,799 feet.

Another delightful route from Sonamarg is to Haramukh. Behind Shitkari, the small village below the terminal moraine of the Sonamarg glaciers, there is a valley opening from the north-west. Up this lies the path to Haramukh, via the lakes Vishan Sar and Gad Sar; the latter is called Yem Sar by the local shepherds.

This is a beautiful upland route. At first the track ascends over green slopes, covered with masses of elder with cream-coloured blossoms. Then the hill-side is clothed with bracken. Overhead the lark sings joyously. Groups of the stately *eremurus* are still in blossom. Clumps of pink balsam, yellow ragwort, mauve scabious, bright blue delphinium, and rich red polygonum impart vivid colour to the luxuriant herbage. Here and there are slopes mantled with thyme or crowned with the prickly spikes of the pale yellow *Morina Wallichiana*.

As we continue to rise we pass groups of scattered pine and sycamore and through glades fringed with birch. The watershed is crossed by the Nichinai pass (13,387 feet) from which there is a fine panorama. On the left, looking south, are the Sirbal peaks; to the right, and beyond the Zoji La, stands Machoi; to the right of this

again is the extensive snow-field sloping up to the Amarnath peak; south of it rise the bold sentinel peaks of Panjtarni, marking the point where the path to the Amarnath cave comes over from the lake of Shishram Nag. Beyond them, still to the right, are the beautiful summits of the Koh-i-Nur group—the Mountains of Light.* Towering immediately above us and extending backwards to our right are the jagged, pointed Vishan peaks of the Sogput group. And from Sonamarg, stretching northwards, there is a very interesting range of limestone crags, cliffs and peaks. Even at a height of 13,000 feet I have found marine fossils, corals and crinoid stems.

To reach Haramukh we must cross two more passes. Leaving the beautiful blue lakes of Vishan Sar and Krishan Sar† on our left, we ascend sharply and cross a narrow ridge at a height of 13,749 feet. A gradual descent of four miles past Yem Sar (Gad Sar), and another day's march past Sat Sar, finishing with a steep climb, brings us to the second pass, the Zajibal Gali, at about 13,500 feet. From the summit of this there is a glorious view. Facing us is Haramukh, rising five thousand feet in a series of sheer precipices, above two exquisite turquoise-coloured lakes. On the eastern and north-eastern faces are two magnificent glaciers. The whole is wreathed in cloud, and mist comes swirling and eddying up from the valleys below. Sometimes the mountain opposite is blotted out, and a glimpse is caught of the summit alone, looking incredibly high; or some fragment of stupendous precipice is framed in a wreath of mist. Anon the clouds lift; and the whole mountain is revealed in its full glory, with its glittering domes and tiers of ice-cliffs, its wide glaciers and rounded ice-falls, its thin curved terraces and sparkling seracs. The highest summit of Haramukh (16,872 feet) was ascended by the writer in 1899 by the western arête; since then it has been climbed from the western

* There are three peaks in the Koh-i-Nur group. They are shown in an illustration opposite page 106 of Major C. G. Bruce's *Twenty Years in the Himalaya*. Major Bruce climbed the north-eastern peak of the group, and Karbir, one of his Gurkhas, climbed the highest and south-western peak (16,852 feet) in September 1898. The middle peak, Kunyirhayan (16,725 feet), was climbed by Captain J. B. Corry, R.E., Lt. R. D. Squires, the Sherwood Foresters, and myself on 30th June 1911 (*Alpine Journal*, Vol. 26, p. 201). They are shown on map 43 N/12, one-inch scale.—ED.

† Both lakes have been called *Vishan Sar* on the half-inch map of the Survey of India. The western of the two should be *Krishan Sar*, as shown on the one-inch map 43 N/3.

end of the lake by General Bruce, who found a comparatively easy route to the summit.*

Gangabal lake is most beautiful. It is normally blue with broad masses of violet shadow lying across it, for Haramukh is seldom free of cloud. Throughout the day in the varying light, in sunshine or cloud, in calm or wind, the waters reflect every shade of green, from liquid emerald to pale eau-de-nil, with darker bands. Sometimes, as in a mirror, we see in their depths every detail of the mountain walls. More often, a gentle breeze throws the reflections into vertical masses of light and shade. In the evening the colour gradually deepens to a dark green and from dark green to violet, grey or purple, while long lines and sheets of light still remain.

The rocks are mainly a pinkish trap. Many are veined or spotted with quartz. Along the shore, in a few places where it is shallow, the boulders impart a reddish hue to the water. Sheets of golden yellow marsh-buttercups brighten the madder-brown of the meadows' peaty soil on either side of the lake's outlet.

Above, I have sketched a few of the delights of travelling from a base at Sonamarg. With favourable weather a fortnight is sufficient to enable one to follow any of these routes and to climb one or more of the peaks to which I have referred. Whatever these peaks may lack in magnitude or mystery, compared with those north of the Indus, is fully compensated for by their technical interest and beauty.

* Dr. Ernest Neve was the first to reach the summit of the highest peak. The Survey of India geodetic station is on the north-western summit (16,001 feet). Colonel T. G. Montgomerie camped on this station for a week in 1858, and from it first observed K², the second highest mountain in the world, at a distance of 137 miles. When I visited Montgomerie's station in 1911, I found his 14-foot square platform intact. Close to the station was a ruined stone hut in the corner of which was a human skeleton. Haramukh and its neighbourhood are shown on one-inch map 43 J/15.—Ed.

ISTOR-O-NAL AND SOME CHITRALI SUPERSTITIONS.

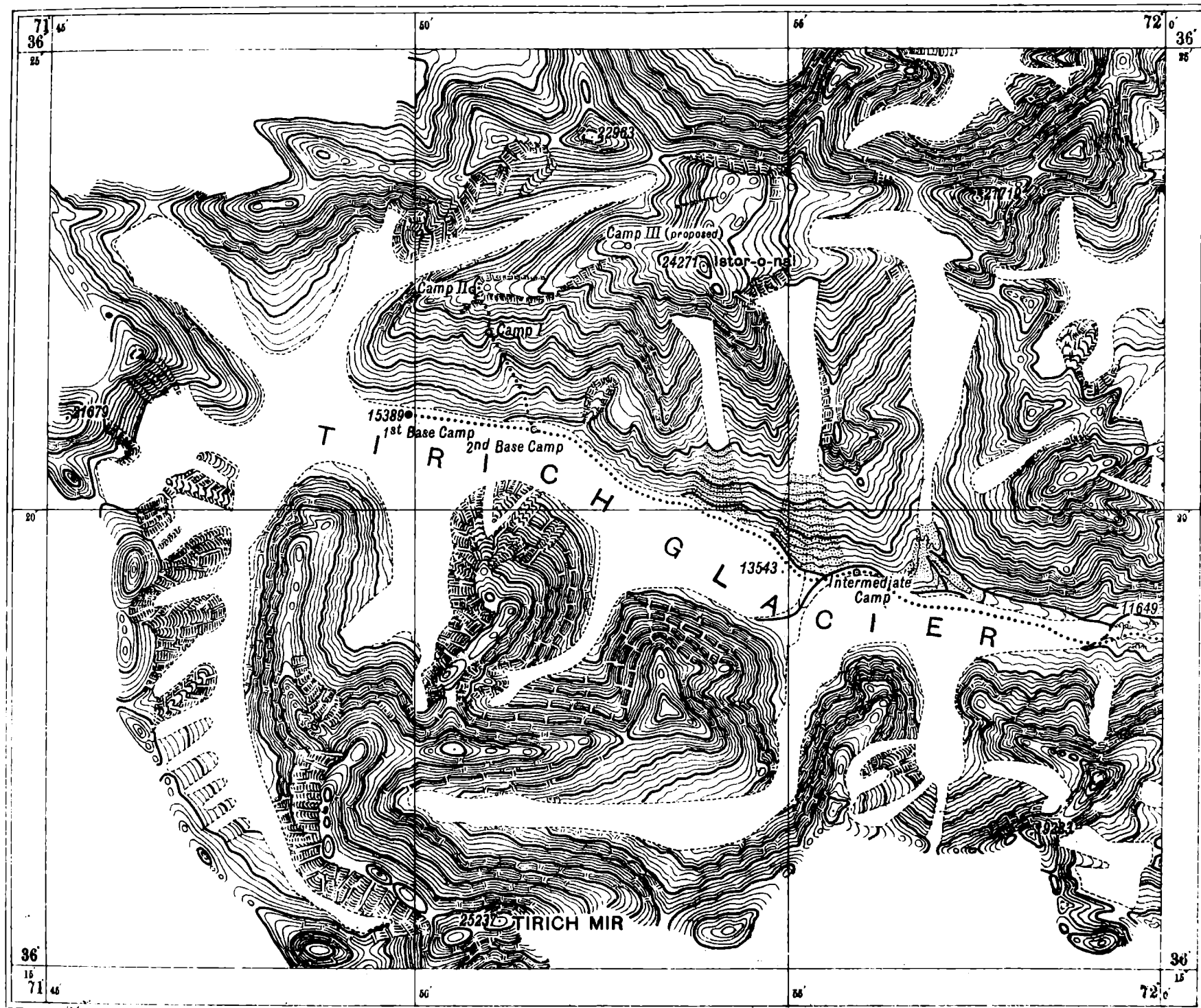
LIEUT. D. M. BURN.

IN the course of triangulation in 1928, I had occasion to visit the Atrek glacier which is fed from the northern slopes of Tirich Mir and from the southern slopes of the high peaks a few miles to the north. Second only to Tirich Mir, the biggest mountain mass in that neighbourhood consists of a horseshoe of peaks of over 24,000 feet, three of which were fixed by triangulation, and the highest of which is 24,271 feet. It has no local name, and we have therefore named it in the local dialect, Istor-o-nal, "The Horse's Shoe."

While climbing from the glacier up the lower shale slopes of this massif, it appeared from a casual inspection that these peaks might be accessible to a properly equipped party. There was no time then for a full reconnaissance, but I was determined that, if I should be sent to Chitral the following year, I would explore the possibilities of an attempt on one of them.

I was again sent to Chitral to finish the survey in 1929, and was fortunate in having enlisted the aid of Captain Culverwell, R.A., a member of the Himalayan Club, who had had much experience of Alpine climbing. He arrived in Sanoghar, my camp headquarters, on the 1st July, bringing with him Major Dutton, R.A. The latter, although not an experienced climber, had spent many months at high altitudes and had marched at altitudes of 20,000 feet without discomfort. The fourth member of our party was Captain Coldstream, I.M.S., who was attached, as doctor, to the Chitral Survey both in 1928 and 1929.

The whole party left Sanoghar on 4th July, all arrangements having been made and stores and equipment for the high camps sorted and packed. On reaching Ataq village at the foot of the Atrek glacier, the first set-back occurred. The coolies who the previous year had willingly taken my equipment on to the glacier and who came from the village of Kosht, flatly refused to move a step in the direction of the glacier. It was impossible to compel them, and moreover with unwilling labour we would have had little chance of success. There was nothing for it but to send to the nearest villages in the sparsely populated Tirich nala. By the time that the Tirich coolies had



Sketch Map of Tirich Mir and Istor-o-nal

Furlongs 0 4 0 1 2 3 4 Miles

Contour Interval: 200 feet

collected rations and reached Ataq much time had elapsed; it was the 9th before Culverwell could proceed on to the glacier for his reconnaissance. As more coolies arrived the rest of the party were able to proceed in driblets. We had with us a trace of the season's survey, on the scale of three inches to four miles, but the first route selected from this was reconnoitred by Culverwell and found to be impracticable. The head of the glacier by which we had hoped to reach the main ridge was hemmed in by a steep rocky wall. There was no time to waste on seeing whether this wall was climbable or not.

On the 17th July surveyor Sher Gul arrived on the glacier to have his work inspected and he was able to suggest another route from his previous knowledge of the area. Accordingly the Base Camp was moved up a third stage from Ataq and on the 18th Culverwell and I reached Camp 1 at 17,900 feet. On the 19th Culverwell with three Chitralis reconnoitred the route for Camp 2. This route lay up a snow gully and struck the main ridge leading to Istor-o-nal (24,271 feet) at an altitude of about 20,200 feet. Above this was some difficult rock-climbing before the snow ridge could be reached. At least, one can consider this rock as difficult at that altitude, though Culverwell has since told me that it would be classed as "easy" in Switzerland. Owing to mist hanging over the ridge, Culverwell was unable to reach the top of the gully, but he had seen enough to convince him that it was practicable. Alternative routes on to the main ridge were examined through field glasses but they seemed to offer no easier approach.

Accordingly on the 21st we set out for Camp 2 with fourteen loads of from 15 to 20 lbs. each, which made up the total for Camps 2 and 3; these loads included a Wild theodolite and stand. The coolies started in fine style and we ourselves reached the summit of the gully confident that the first step had been successful. Unfortunately, the coolies, although reasonably fit, had subsided in the snow about half-way up the gully and nothing would persuade them to make a further effort. At the summit of the gully a wonderful view was obtained; the north side of the ridge was found to be precipitous, with a slope of not less than seventy degrees in many places. Below lay a scarred and twisted glacier whose presence the surveyor had sadly overlooked.

Culverwell spent some two hours on the rocks above with one Chitrali and had passed the most difficult pitches by the time it was necessary to return. We spent the next few days in reorganizing the coolies and succeeded in getting ten loads up to Camp 2, as well as four

loads of wood. Beyond there we would, of course, depend entirely on spirit. The weather had however broken and, owing to the conditions at Camp 1, we had perforce to descend to the Base Camp after nine nights spent at nearly 18,000 feet. We hoped against hope that the weather would clear in time to allow us to make a second attempt, but after several days' continuous rain and snow, Culverwell and Dutton were unable to stay longer and the project had to be abandoned. The coolies, too, refused to stay on the glacier any longer.

The spirit of the Chitralis, which had without exception been at its lowest ebb, at once soared up on the order for returning being given. The party reached Sanoghar on the 31st July after an extremely interesting if unsuccessful effort.

We were undoubtedly defeated first by the quiet non-co-operation of the Chitralis and finally by the time factor aided by a bad break in the weather. This is not to say that we could have climbed the peak under better conditions. But at least on our first reaching Camp 2, the outlook was rosy and we considered the chances were good. The last two thousand feet of the climb may present insuperable obstacles, or may be only honest plodding, but in my opinion, no one will climb the peak in the near future if he relies solely on Chitrali help.

Like all hill people who only touch the fringe of civilization the Chitrali is steeped in superstition. He peoples the mountains with malevolent fairies and the glaciers with strange monsters. Ruined houses and graveyards are the abode of jins and spirits.

The home of the fairies is Tirich Mir and on first seeing this great mountain it is easy to understand the strange fears and imaginings of this child-like people. High up on the slopes of Tirich Mir exists a marble-lined tank in which the fairies bathe, and it would be certain death for anyone foolhardy enough to approach it. Strangely enough one may visit with impunity a pool quite low on the approaches of Tirich Mir above Ojor, where the fairies come to wash their clothes, for the one attribute of the fairies, on which all are agreed, is their scrupulous insistence on cleanliness. After some months in the country, we were approached by the escort jemadar, who said that while he had not liked to say so before, we were extremely foolish to keep so many dirty coolies at high camps if we wanted fine weather for our observations. The filthy clothes of those coolies apparently incensed the fairies and we were very lucky that they did not show their resentment in any more marked way than by sending clouds and snow to induce us to descend. Doubtless their clemency was due



Photo. E. R. Culverwell.

TIRICH MIR, 25,237 FEET, FROM THE NORTH.

to the presence of a white man, for being white-skinned themselves, they were known to have a preference for sahibs. He himself was always careful to wear clean clothes before a high climb.

I personally took the jemadar's advice and after four days of snow the weather changed to bright sunshine the day after the coolies were sent down, and the work was soon completed. I was pleased; the jemadar was pleased; and the coolies no doubt were the most pleased of all.

There is a quaint superstition about the Thui pass which is a fairly difficult route from Yarkhun to the Yasin valley in Gilgit. If anyone is killed while attempting to cross this pass, there will be clouds on the pass for three days, which is the time taken for his spirit to reach heaven. This was well borne out last year when a member of our party was camped in the neighbourhood. A Gilgiti lost his life on the pass; he fell into a crevasse and was killed instantly. Sure enough on the fourth day the clouds lifted and perfect weather ensued.

The fairies are popularly credited with rolling rocks on to anyone who approaches their fastnesses and they have even gone so far as deliberately to dislodge a man's hands from a rock and thus precipitate him to a fearful death below. This can only have been the fate of the one or two hardier Chitralis who have been lost to the ken of man since venturing on the peaks surrounding Tirich Mir.

Small wonder is it that our Chitralis gave us less than half-hearted support in our attempt on a peak in the heart of the fairy kingdom. Even the jemadar, who had proved himself a tower of strength on lesser peaks and who was a born climber, himself discouraged the coolies from helping the sahibs in their mad attempt. One cannot blame him. In his implicit belief that we would all go to our deaths through a supernatural agency, he was merely doing his duty in thwarting our efforts by fair means or foul.

On a previous occasion a coolie was lost in the jumble of moraine on a big glacier. When I ordered a search party to be formed, the jemadar pointed out that a search would in all probability be useless, as the man had almost certainly been devoured by a glacier dragon. While no word exists in Chitrali for dragon, his description was quite clear. He himself with some twenty coolies had seen one a day or two previously. It had reared its head and neck from a crevasse and given them a nasty look. Whereupon they had incontinently fled. It was useless to use his rifle, for the brute was encased in hard scales which as every one knew no bullet could pierce. Its head was something like that of a horse and he estimated the length of the

whole monster to be about twenty feet. He did not notice whether it had wings, nor apparently did it breathe fire. Doubtless this breed is peculiar to Chitral. Failing the odd coolies it is difficult to imagine what these brutes exist on, but perhaps, as the jemadar suggested, they eat stones. As a matter of fact, the coolie eventually turned up with his load, which fortunately for him consisted of blankets and a 20-lb. tent.

The glacier frog, which I believe exists, is reported to have been seen by many shikaris and others who have had occasion to visit the higher moraines. A modest estimate of its size from the evidence of these witnesses is about twelve inches long.

Finally there are the jins, who though much more in evidence in the olden days before the British Raj, may be said to die a hard death. They choose old deserted dwellings to live in, the larger the dwelling, the larger the jin that may be expected to emerge. They have a disconcerting habit of assuming the guise of a dog or a cow until they are within a few feet of the unsuspecting traveller. They then disclose their frightful reality and the unfortunate who gets away with a withered arm or a mouth twisted almost to the back of his head is indeed lucky. Many become hopeless idiots for the rest of their lives.

In the course of two years' work in Chitral the above are the only authentic superstitions with which I have come in contact. Doubtless there are many more and the whole subject would well repay a detailed study.

IN THE FOOTSTEPS OF THE GERARDS.

W. E. BUCHANAN.

IT is now a little over a hundred years ago that the two brothers, Captain Alexander Gerard and Dr. J. G. Gerard, carried out their pioneer explorations in Bashahr, Spiti and Kanawar. Alexander seems to have made more journeys than J. G., and to have climbed almost every pass on the Cis-Sutlej range, between Simla and the Baspa valley.

Some time before the war two very interesting books containing the narratives of these travels came into my hands and fired me with a desire to go over some of the ground the brothers covered, but it was not till the 17th September 1917, exactly a hundred years after Alexander Gerard was at Simla, that I followed in his footsteps, and set out for the Baspa with stores sufficient for about two months.

Captain Gerard thus describes the last three miles to Simla, from about the site of modern Boileauganj :—

“The first half mile the road lay upon a right-hand hill and through oak and booran; the next half mile upon a left-hand hill, and likewise through oak and booran, and the rest of the way sometimes upon the top of the range, and sometimes on one side and through cheer and keloo trees.

“Reached Semla, a middling-sized village at 12-30 p.m., stopped here during the day, and at 5 p.m. marched to Juko distant one mile and one furlong and encamped at a hut about 60 yards south-west of the flag-staff near a small tank almost dry.

“The road from Semla was an ascent the whole way, steep and rocky in several places, and through keloo and oak trees and with very thick underwood which is full of bears and hogs. The rocks from Syree to the Chand Nudee are all clay slate; from thence to Semla there is a great deal of mica, and the hill of Juko is composed of dark blueish limestone.”

It is difficult to follow this description to-day, and I have been unable to identify the “booran.” Gerard’s geology of Jakho is also

at fault, for what little limestone is visible is definitely yellow and not dark blue.

Gerard probably changed his transport at Simla, and without much difficulty. Even in 1917 coolies were quite easy to get at a reasonable wage at all stages, for I had armed myself with *parwanas* authorizing me to do so.

My first marches to Fagu, and via Sainj, Jubbal and Rohru, roughly parallel to but south of the Hindustan-Tibet road, were spoilt by rain, for the year was one of the wettest on record, the rains persisting steadily till October, south of the main ranges. From Fagu my road wound down to the Giri valley, the first halt being at Sainj, where there is a rest-house; then on to Kotkhai and eastwards over the pine-clad watershed to Deorha, in Jubbal. Some six miles beyond Deorha the Pabar valley is reached, hot and steamy from its rice-fields. Rohru is about eight miles up the valley, and was the last place where there is a rest-house; from there on I had to camp till I reached Sangla in the Baspa.

My road now led up the valley past Chergaon to Gunian, where I turned south-east up the Larut spur and crossed the Changsil pass (12,585 feet) to the little village of Dodra, to Ketruar on the Rupin river, and to Jaka, the last village from which I could obtain coolies for crossing the Rupin pass to the Baspa. At Jaka it poured with rain for two whole days, and, being September, snow lay down to 10,000 feet. Rather naturally the Jaka villagers tried to dissuade me from crossing the pass, which they said would be impassable, and suggested that I should return to Rohru and climb to the Hindustan-Tibet road at Sungri. But I was determined to make an effort to cross the Rupin pass, and on the 2nd October left Jaka with between thirty and forty coolies, lightly laden owing to the deep snow, and carrying five days' rations.

The march from Jaka is very fine, the road ascending gradually through forests of silver fir, and then of sycamore and birch, until suddenly the valley widens. The river is no longer a roaring torrent but a mere stream rippling through the open valley, and surrounded by huge cliffs. Further up this gives place to an amphitheatre of snow peaks and glaciers feeding a beautiful blue lake. Here, at Surubasa, and at an elevation of 11,000 feet is the foot of the Rupin pass.

The coolies passed the night in a cave, and were probably warmer than I in my tent, where the thermometer fell to 33°F. The

following morning we were away by half-past eight, but after a mile of good going the path was entirely obliterated. Twice we crossed snow-bridges, about two feet thick and rent with chasms, through which we could see the river tossing over the boulder-strewn bed. The snow became deeper as we ascended, while the sun-temperature seemed higher than any I had experienced in the plains of India. The glare was terrible and many of the coolies let their long hair fall over their faces to shield their eyes. The last few hundred feet at an angle of about forty-five degrees were particularly trying, my servants having to be hauled up in a state of collapse by the coolies.

According to Gerard, the Rupin pass is 15,460 feet above sea-level. The Survey of India map, which does not seem to have been revised for many years, gives no height to it.* It was strange to be told by the coolies that when the pass is clear of snow the grass has a bad effect on the head—an exactly similar statement to the one they made to Gerard. It is normally reckoned to be an easy pass, but after two days' snow it is most exhausting, and I cannot recommend it for the ordinary traveller after the 15th September, when there is risk of a storm.

I was personally quite fit except for the usual shortness of breath at this altitude. The Baspa side was comparatively easy; much of the snow is deposited before crossing the range and there was little on the far side. Within a few hours we were down to cultivation again, and it was amazing to see the villagers reaping the beautiful dry barley, while all the amaranth and buckwheat on the Rupin side of the pass lay in sodden heaps, ruined by rain. We camped at Dogri, with a magnificent view of the Kanawar Kailas peaks before our eyes, and reached Sangla in the Baspa valley the next morning, where I paid off my coolies and gave them cigarettes. They immediately started back for the pass, singing and cheerful. I had found all the Bashahris in the Pabar and Rupin valleys most pleasant to deal with. Few Europeans seem to visit them and at first I often found them running off to hide when they caught sight of us. But it was easy to gain their confidence by means of a few simple medicines, and their faith in a tabloid administered by a European was most

* Survey of India map 53 I, scale 1 inch = 4 miles. See also footnote *Himalayan Journal*, Vol. I, p. 68. A note on the survey of the Baspa valley appears in this volume, page 140.—ED.

touching. It was however amusing to note how the inhabitants of each village on the way to a particular pass would assure me that that pass was the worst in Asia, while the one in the neighbouring valley, which would entail using other coolies, was ridiculously easy.

The Baspa valley is well worth a visit, though for mere beauty it can hardly be held to compare with Kulu or Kashmir; for it is almost beyond reach of the monsoon and the hills on the north appear scorched and barren. Yet here, as at Chini, the sky may be heavily overcast each afternoon, and there may be thunder. Rain appears imminent; yet it passes off generally with a few spots, though occasionally it drizzles for a few hours.

One of the great beauties of the valley is the vista of fields of pink buckwheat (*ogla*) in flower, and during August this is at its best. Wild flowers too are luxuriant, particularly a deep pink balsam. Geologically the Baspa interested me, and I have never been able to decide whether the enormous mass of debris, upon which Sangla itself is built, is an ancient moraine or merely a talus.* I incline to the latter, which would indicate that the rains at an earlier date must have been more torrential than to-day, for comparatively little detritus is brought down nowadays.

The landslide of rocks between Sangla and Rakoham is also most interesting. It has literally buried the valley to a depth of some hundreds of feet, and I can only conjecture that it must have been caused by an earthquake. The bridge over the Baspa at Sangla is noteworthy for the fact that the pier on the left bank is formed by a huge boulder which apparently fell from the hills and smashed itself in half on impact.

My second visit to the Baspa was in 1920, when I went to explore the Charang pass, leading out of it north-eastwards from Chitkul to the Tidong tributary of the Sutlej.† This pass is described by Mr. H. M. Glover in his paper *Round the Lesser Kailas*, in this Journal, and I will therefore only refer to it briefly. Captain Gerard ascended it on the 9th July 1821, and describes it as follows:—

“About the height of 16,300 feet, the barometer being 16,536, there commenced the perpetual snow in continuous beds, the next

* See Mr. H. M. Glover's note at the end of this article.

† See note on page 97, Vol. I, for the various spellings of Tidong.

half mile was also on a gentle acclivity over the snow, which gave way to the depth of two feet, and lastly we ascended the steep slope of the pass.

“It was scarcely half a mile, but it surpassed in terror and difficulty of access anything I have yet encountered.

“The angle was $37\frac{1}{2}$ degrees of loose stones, gravel and snow, which the rain had soaked and mixed together, so as to make moving laborious and miserable; and it was so nearly impracticable that although I spread myself on all fours, thrusting my hands into the snow to hold by it, I only reached the crest by noon, and then under great exhaustion.”

My own ascent was made on 28th September, when the snow was at its minimum. Nevertheless it was a tiring climb, the principal feature being the miles of rocks which have to be crossed, stepping from one to another. The final ascent, which from a little distance looks like a solid wall, is made by a rough zig-zag track up very loose stony slopes, where a footing is not easy. The view from the summit is wonderful, the barren Tidong valley and its glaciers on one side, and the southern Baspa peaks on the other.

It took me four and a half hours to reach the crest. Except for shortness of breath I felt no ill-effects. I sat down and sketched; and except for the cold, I might have been at 7000 feet instead of 17,348, the height estimated by Gerard. The descent was very much more trying than the ascent, but I was back at Chitkul by half-past four.

My third visit to the Baspa commenced from Simla on the 20th July 1926. Conditions had changed, for the *begar* system of coolie transport had been abolished. Delay in collecting coolies is therefore inevitable, and it is more economical in time and money to employ mules. I am however told that it is still possible to get coolies in Bashahr in the side valleys off the beaten tracks, though at higher rates than formerly. Animal transport of course ties one very much to the main roads, where even ponies have to be unloaded in places if the track is narrow.

It was fine as far as Narkanda, but rained daily from here until I reached Wangtu. From Narkanda I went over the Hatu Dhar, or *Whartoo*, as the Gerards called it, for their description of the flowers on the summit attracted me; but I was rather too early, and here, as elsewhere, August seems to be the best month.

I passed the mouth of the Baspa valley and found Chini very pleasant during August. No wonder that Lord Dalhousie, the Viceroy, left the depressing damp and rains of Simla for the comparatively dry air and sunshine of Chini. Not that there is no monsoon at all here, for clouds gather daily, as in the Baspa valley; the moist air seems to penetrate right up the Sutlej, and the mornings are often misty, with an occasional drizzle of rain.

I went up the valley as far as Jangi and returned to Kilba on the 12th August, reaching the Baspa-Sutlej junction the next day. Here my troubles started. The road up the Baspa valley, which in 1920 was excellent as far as Sangla, had been very badly damaged by the heavy rains of September 1924 when it had poured at Simla for four days without stopping, and must have been as bad here to have so wrecked the road.

With the utmost difficulty I reached Brua, frequently over a path eighteen inches to two feet wide. I looked back with horror to watch the mules trying to cross this path, one man holding the tail and another the head. At Brua we could take the mules no further, and I had to leave them there and engage coolies to take me to Sangla. At one place we had to crawl over and under roots and branches of fallen trees, where a slip would have taken us down to the river. It was a marvel how the women coolies negotiated such places with a fifty or sixty-pound load.

Sangla was reached at last, and it was very pleasant to be in the old rest-house again, where I happened to notice that there had been only about half a dozen visitors since I was here six years before. The breakdown of the mule-transport upset my plans, for I had wished to explore the side-valleys, mainly for the flora above 12,000 feet. I have never been able to understand why the fact that an important trade-route was in a derelict condition could not have been notified in the rest-houses along the road for the benefit of travellers.

On the 31st August I met a coolie with some very beautiful blue flowers, and he promised to take me to the *khanda*,* where he had gathered them. The following morning we set out at seven o'clock taking the road to the Rupin pass, but on reaching the nullah leading to it turned up a side valley. After clambering over rocks and mud we reached, about one o'clock, a height of about 14,000 feet. Snow

* A *khanda* literally means "a shoulder," but it is here applied to almost any hill above 12,000 feet.

lay about in masses ; and here I came across blue poppies in a profusion I had never seen before, and among them the flowers I was seeking. They were, I think, some species of delphinium, but I have been unable to identify them in any botanical book* ; they grow about 18 to 24 inches high and have a very sweet scent. They are in great favour with the Bashahris, who gather them for the fairs which are held early in September in every important village in the Baspa.

In addition to these flowers, there was a striking plant something like a lettuce, with a dark flower in the middle, also beautifully scented, but whose name I do not know ; and the "cobwebby" sacred Saussurea.

I think I must have been somewhere in the vicinity of Gerard's "Nulgoon pass," but with mist and rain coming on, it was too late to get to the summit ; I therefore contented myself with gathering a large bunch of flowers from which to make drawings, and descended to Sangla, wet and weary. The poppies kept well in water for several days, but the others, though apparently less delicate, died quickly.

On the 4th September the Sangla fair was held, the *deota* being brought from the temple on the opposite side of the river to the little green just below the rest-house. The god was decorated with flowers, and, suspended on flexible poles, swayed up and down, while men and women in single file performed a slow movement round him to the accompaniment of drums, cymbals and trumpets.

First about twenty or thirty women in skirts and shawls, with their pigtailed under their little circular hats, danced round the *deota* ; they were followed by about the same number of men in holiday attire, woollen coat and narrow trousers with red cummerbund, each carrying in a *chudder* on his back a load of blue delphiniums ; lastly came some thirty men and boys carrying poles, each with a bunch of ten or twelve "lettuce" flowers tied to it. And every man, woman and child wore the blue delphinium in hat or hair, and continued to wear it for days, until finally it dropped off.

The fair and dance lasted till about six o'clock in the evening, when the god was taken back to his temple across the river, and the villagers dispersed.

Life in the rest-house would be quite impossible but for the fact that the roar of the river drowns the noise of the temple horns and bells, and the barking of dogs. Before leaving Sangla I took a lovely

* Kashmir Larkspur, *Delphinium Cashmerianum*?—Ed.

walk through the glorious groves of walnut and pink *ogla* fields, and visited the picturesque Kamru fort on the other bank of the river. On the 6th September I started homeward, following the route so well described by Major Shewen in the first number of the Journal.*

* Mr. H. M. Glover, Imperial Forest Service, who knows Bashahr well, writes as follows :—Mr. Buchanan crossed the Rupin pass which lies on the watershed between the Sutlej and Jumna catchment areas. The pass is open throughout the summer, but it is advisable not to attempt it late in the year. When I was in Bashahr as forest officer some years ago I heard of one family camping under a rock for the night, being buried by an avalanche ; and I saw men whose hands and feet were mere stubs, owing to frostbite. I cannot agree with Buchanan that the Baspa valley is inferior in beauty to Kashmir and Kulu. Had he seen it a month later, in October, when the buckwheat is cut and its scarlet stalks are left in the fields, when the bushes have acquired their autumn colouring, and when early snow has covered the upper slopes of the mountains, he would, I think, have revised his opinion. In the monsoon the valley is a drab monotone, in common with most parts of the hills, but in autumn the valley is full of colour and is perfect—so, incidentally, is Kashmir !

Buchanan refers to the geology of the valley. The signs of glacial action are everywhere apparent : the widening of the valley at Sangla was caused, I think, by ice action, which dug deeply behind the restriction of the Raturang gorge : the river at Raturang appears to have cut through a huge terminal moraine, which formerly blocked the Baspa valley and caused a lake to form at Sangla, only to be subsequently drained as the Baspa river deepened its bed ; the greater part of Sangla village, in fact, lies on a raised beach.

Buchanan was fortunate to see the Phulaich fair, which is celebrated throughout Kanawar during the monsoon, and is one of the prettiest and most interesting fairs in the whole Himalaya.

ROUND THE KANAWAR KAILAS.

H. M. GLOVER.

IN June 1928 my wife and I were on tour in Bashahr State, and had occasion to make a journey round the Kanawar Kailas. The route lay along the Tidong valley * and then southwards across the Charang pass at 17,600 feet to the beautiful Baspa valley.

The Kanawar Kailas mountain lies north-east of Simla where the Sutlej river cuts through the Great Himalaya.† From the forest bungalow at Chini, 9,400 feet above sea-level and 145 miles from Simla along the Hindustan-Tibet road, the Kailas massif is seen to advantage. The snow-fields are so close that in spring the reflected light from the snows is painful to the eyes, while during the monsoon the sound of falling avalanches can be heard all day long. The topmost peak, Raldang, 21,250 feet, shows only its head above the lesser peaks, which hide it from the bungalow; to the right lies "Castle Rock," while the name "Kailas" is given to a pillar of rock which lies away to the left. Snow-fields, that can be seen from the hills near Simla, stretch away to the interior and end in hanging glaciers, being separated from the forests which clothe the lowest slopes by enormous precipices, unclimbed as yet and ever likely to remain unsoiled by the foot of man. At the base of all flows the turbulent Sutlej river, thundering through narrow precipitous gorges fifteen thousand feet below the topmost peaks.

From the alpine pastures behind Chini even finer views of the range are obtained, and from the Hindustan-Tibet road itself the view for several miles on either side of Chini is magnificent. For those who cannot afford the time to tour more extensively, Chini alone repays a visit, especially in spring or autumn when snows cover the higher slopes.

This Kailas is steeped in the tradition of Hindu mythology and legend, and is reputed to be the abode of the souls of the dead. The

* *Todoong Gar* of the old atlas sheet. See footnote on p. 97, *The Himalayan Journal*, Vol. I.

† The Kanawar (or Lesser) Kailas must not be confused with the more sacred Kailas 22,028 feet, which lies to the north of the Manasarowar lake, and gives its name to the Kailas range.—ED.

death of the Rajah is said to be heralded by a cascade of water bursting from the centre of a precipice high above Shongtong and visible from Chini. Kali, the terrible, inhabits the heights, and in the villages *deotas* are worshipped by the peasantry, which believes that through their agency calamities are averted and the evil machinations of demons are held in check. Where nature is uncontrolled and avalanches frequently carry away everything in their path, it is natural that the goddess of destruction should reign supreme.

During and shortly after the War a road was built by the Forest Department through the cliffs at the base of Kailas. Man after man was killed, generally by preventable accidents, and after each death goats had to be provided to appease the evil spirits. At last, however, an avalanche carried away the subordinate in charge of the work and two of his assistants; the village of Mehbar was partially destroyed and again the labourers bolted. More goats had to be supplied before the men could be induced to return. At last the demon appears to have been sated with goats' flesh, and the work was finished in peace.

The tour of the Kanawar Kailas in a clockwise direction is undertaken by devout Hindus as an expiation for past sins, but few Indians from the plains make the journey owing to its length and difficulty. I had work both in the Kailas forests and in the Baspa valley and took the opportunity thereby afforded to travel by the pilgrimage route. The paths are rough and transport is by means of coolies, who cannot easily be obtained unless the traveller has local influence. It is not advisable for anyone to attempt the journey unless helped by the State.

From Chini a bridle-path descends to the Sutlej, which is crossed by a *jhula*, or steel hawser on which runs a pulley carrying a somewhat primitive seat. Here we were met by the Wazir of Poari dressed in full Bashahri costume and pancake hat, which reposed above his bobbed hair at a most rakish angle. The local Zaildar was with him and evidently feared that he was to be taken along with us, as he exaggerated the difficulties of the route. From Poari a good bridle-path goes to Purbani, where is the last forest rest-house, and two short marches lead to Rispa at the junction of the Sutlej and the Tidong. From here on the path is only just fit for ponies and runs along precipices where one has to dismount and walk, a tiring journey until Tangi is reached. Tangi is a large village high above the Tidong stream on a shelf of cultivation; the houses are of stone and wood several stories high and strongly built in order to withstand the deep

winter snow. The hills are very precipitous ; deodar and edible pine cling to the steep ground and fields are very few. As this is the dry zone beyond the reach of the south-west monsoon, cultivation is impossible without the help of irrigation. In order to bring water to the fields opposite, a channel has been built through what appear to be quite inaccessible precipices ; but with the help of dynamite ledges have been blasted and hollowed tree-trunks have been placed in position at the risk of broken necks ; the people are most grateful to the Government for having given them explosives and lent them tools for this most hazardous work. But, as I have said, without irrigation the land is uncultivable, and, as there is always a great shortage of grain throughout the long winter months, a life or two lost in the work of construction is a cheap price to pay for a few additional acres brought under the plough.

At Tangi there is a fine Buddhist temple which has doubled in size since we were there a dozen years before. Buddhism is undoubtedly on the increase in Kanawar and a lama had been imported from Tibet to paint the interior of the temple with portraits of Buddha with his thousand eyes and thousand feet. We were given a great welcome, garlanded and taken over the temples to admire the paintings which, though hideous to western eyes, were remarkably well done.

The people are largely pastoral and own extensive flocks of sheep and goats, but they are also great traders, going far into Tibet, using these animals to carry grain ; this they obtain from the outer hills and barter in exchange for wool and borax in Tibet.

Throughout the border tract of Kanawar the inhabitants have long ago solved the problem of an insufficient food supply and an increasing population ; several brothers marry one wife and the surplus girls are devoted to celibacy. The nuns sometimes live apart from the family in nunneries, but return to it for the harvesting ; their hair is cropped and they frequently wear men's clothing. All work in the fields, carry loads, have a great amount of freedom and are as cheerful a set of maidens as can be found anywhere in the world. Polyandry used to be encouraged by the State under the old system of *begar* or *corvée*, whereby one man of a household spent six months each year on State works, a burden reduced later to one month and nowadays still further curtailed, so that it now weighs very lightly on the people. Households are being split up, but polyandry has a distinct economic advantage in these inhospitable tracts where living is so very difficult : one brother trades between Tibet and the plains,

one grazes the flocks, one earns money on forest or road works, and one remains behind with the wife.

An exceptionally rich man, however, possessing wealth by virtue of large flocks of sheep and goats, both in Bashahr and in Tibet, sometimes marries several wives, as we found on this trip. Janki Das, the Lambardar, was with us for several days ; when we came to some particularly fine pasturage and asked who owned it, he usually replied : " I do ; one of my wives stays here for the summer." But the ladies did not seem lonely, for Janki Das has brothers ! When making payments for petty works on daily labour, it is customary to record both the man's name and his parentage ; a roar of laughter will often greet the father's name and the man will rapidly change it at a suggestion from the onlookers.

From Tangi we followed for fifteen miles along the main Tidong valley the path which is very rough but much improved since I was there some years before. It leads to Tibet and is one of the trade-routes, though narrow and precipitous, and in places flooded by the river. We left this path on crossing the Tidong by a cantilever bridge and camped at Shutingi at the entrance to the Charang valley ; and glad we were to get there, as the constant ascents and descents were most tiring. Before leaving the Tidong we went as far as Charang, the last village on the British side of the Tibetan border, and spent some hours at the Buddhist temple about a mile and a half beyond the village. Here all forest has been left behind and the country is rugged in the extreme. The temple was a small square building full of images, banners and paintings, while little brass vessels were full of offerings. The head lama informed us with pride that the temple had not been erected by man, but had miraculously appeared in the course of a single night : a fact hardly borne out by the well-dressed stones and the carved wood-work.

A fair was in progress and for hours men, women and children, all of small stature, but of robust physique and with Mongolian features, " processed " round the temple, chanting and turning the prayer-wheels fixed in the walls. The children ran races for four-anna bits, but when the men were offered a rupee prize they declined to race, urging that it was too late and that they were already drunk, a fact which we could easily believe when we saw the amount of liquor that had been consumed.

From Shutingi a steep ascent led to the Lalingti *thach*, an open grazing-ground where we camped below the snow-line. Although we were at 14,000 feet above sea-level it was hot in the middle of the

day ; there was no shade whatever, and the thermometer showed a temperature of 96°F. Yet at night it was so cold that the water in the kettle froze solid. This valley ordinarily contains burrhel, but we only came across one female, and although I searched the neighbouring nullahs I saw only a few ewes. This dearth of game was explained when fresh snow-leopard tracks were met with, the rest evidently having retreated to inaccessible precipices. On one occasion, when I was traversing a ledge, a snow-cock fluttered in front of me, apparently with a broken wing and behaving just like a mother partridge with young near by. Sure enough a search revealed a nest with the prettiest little downy grey chicks.

We left before dawn the following morning and were able to ride diminutive hill-ponies for about three miles, when they had to be sent back before the real climb commenced. The snow was firm and the going good till near the top, where the snow was lying at a very steep angle. The last five hundred feet tested our powers of endurance. To the right lay the glaciers and the vast snow-fields and outlying peaks of Kailas, whilst close to our left were a succession of hanging glaciers. Looking back towards the north we saw numerous peaks between the Tidong and Tibet, distinguished solely by letters and numbers on the Survey of India maps, and lit up by the early morning sun, a sight never to be forgotten.

On the top of the Charang pass we rested and attempted to smoke, but at this elevation, 17,600 feet, tobacco had lost its flavour. From the pass we could see right into the snow-fields above the glaciers, and it would seem that this would offer a possible route of approach to the highest peaks of Kailas. To the south lay the Baspa river and beyond it numerous glaciers ; the views were magnificent.

Unfortunately the snow was softening rapidly, and with a long and tiresome descent before us we could not tarry long. At first the snow lay very steeply and every step had to be taken with great care, particularly where there was a thin crust over the ice. Below this were snow-fields ending in steep terminal moraines of former glaciers, jumbled masses of jagged rocks down which we scrambled laboriously, till at last we reached a rough path leading to the village of Chitkul far below.

The crossing had taken eleven hours and we had been lucky in the perfect weather, a marked contrast to that of ten years before, when I had crossed in mist and snow. Like most passes in the high hills there is little danger when an early start is made and when the weather is fine ; but shepherds avoid it except in favourable seasons,

for bad weather renders the crossing not only difficult, but dangerous. Lives are frequently lost when attempting the pass late in the year.

We were now in the Baspa valley, so well described in the last volume of this Journal. The scenery had changed and although equally magnificent it was less barren. Two more marches took us to the comfortable forest rest-house at Sangla.

Geologically the trip was most interesting : Kailas itself consists of metamorphosed gneiss, with massive granite exposed at its base. Opposite Rispa the contact between the gneiss and the sedimentary rocks of the Haimanta series is well shown. The Tidong river follows roughly the great fault between the gneiss and the Haimantas, which has been traced as far as Nepal ; and outliers of this series lie amongst the gneiss and granite to the east of the Charang pass. The geological formation is reflected in the conformation of the hills, the peaks beyond the Tidong river being much more jagged than those formed by the crystalline rocks, and clearly showing the lines of stratification.

The lower parts of the Tidong show the typical V-shaped section of valleys formed by river action : glaciers and all signs of ancient glaciation being confined to high elevations. The Charang valley above Lalingti has been carved out by snow and ice, whilst signs of old glacial action are everywhere present in the Baspa.

The rocks of the U-shaped Baspa valley are smoothed by the movement of glaciers, which have retreated in comparatively recent times. At Rakcham and below Sangla are the remains of old terminal moraines, which formerly dammed the river and formed lakes until they were cut through by the never-ceasing persistence of the water.

The valley at Sangla is very fine indeed, but to be seen at its best it should be visited in the autumn, when the river has cleared to a turquoise blue ; the buckwheat has been cut leaving acres of blood-red stalks in the fields ; the deodar forests, as ever, are a dark green mass running up into the birches, the leaves of which are turned to a golden yellow ; and above all are thousands of feet of precipice and eternal snow.

We leave this valley with regret. Lucky is he who can spend a few days of leisure or duty in this lovely part of the Himalaya.

THE MAZENO PASS.

CAPTAIN J. BARRON.

THE Mazeno pass is not unknown. But a brief description of a recent visit may be of interest and will revive memories in at least two members of the Club.

The Rupal Nala runs from west-south-west to north-east. Its valley is blocked at Tarshing by a glacier descending from the Nanga Parbat ridge. The stream, however, flows beneath the glacier and, turning east-south-east, is joined by the Chichi Nala, eventually meeting the waters of the Kamri stream : and so to the Astor river.

I crossed the glacier near Tarshing in June 1929 and found myself truly in the presence of Nanga Parbat, that unconquered giant, 26,620 feet above sea-level. Sunrise from such close quarters was a sight worth seeing, and the view of the whole massif directly to my north-west was superb. But soon, perhaps at seven-thirty in the morning, Diamir herself, as the locals call the highest summit, was veiled by fleecy clouds. They rose from her glistening snowy flanks as the sun grew stronger. "The fairies are baking their bread," I was told.

About seven miles from Tarshing I crossed another glacier, descending from the great peak. From the top of this glacier, where I rested for a few minutes, I gazed on over fifteen thousand feet of mountain, rising sheer before my eyes. The summit could not have been three miles distant and appeared even closer. And, as I looked, a huge avalanche broke from the very summit and stopped not half a mile from where I sat, covering the whole valley with a drenching cloud of snow. This avalanche seemed to take a full minute to descend, giving me ample time to photograph it. I then crossed a large grassy maidan, passed two more tributary glaciers, dirty and insignificant, and reached the great glacier that fills the whole head basin of the valley. It must be about thirteen miles long and some two thousand yards across. Here I pitched my tent : From my door I could count ten glaciers, their upper regions gleaming white and capped by great slopes of snow, increasing in steepness till the crests were reached—huge corniced crests, casting a midday shadow. I remember wondering how it was that snow ever rested there.

I was camped, after a tiring walk in the hot sun over debris, boulders and all kinds of obstacles, on a soft grassy slope, with a clear bubbling stream at hand, and dried-up juniper not far to seek. The place was known locally as *Kino ka Bas*, "the resting-place of Kino." I was told that Kino was a mighty hunter in bygone days and lived in Bunar. Once he had crossed the range, had shot a gigantic markhor in the Rupal Nala, and spent a night at this spot. It was a delightful camping-ground, some 12,500 feet above sea-level, and well out of the wind. My local expert told me that no one now ever crosses the range if they can help it, as they are affected by headache and mountain-sickness, though they cannot say why.

In the old days before the British arrived, many were the raiding parties which used to invade the Rupal Nala and carry off the ponies, cattle, and herds grazing on the luscious Rupal grass. And it is recorded that once a Dogra army from Kashmir, some three or four thousand strong, under an officer called Bakshi, crossed the Mazeno pass into Chilas on a punitive expedition and recovered much stock, though hundreds of porters are said to have perished from hunger and cold. The main facts are undoubtedly true, though, judging by present conditions, it is hard to believe that animals could ever have been brought over.

Starting at 3-45 a.m., we made our way up a side-valley, climbing steeply over a ridge which must have been 16,000 feet above sea-level. Here we came upon the tracks of ibex, but found very little snow. On the far side we looked down into the Mazeno valley and glacier, which descended gently from its snowy head and led up to the pass, an acute V-shaped notch in the main ridge.

The Mazeno glacier was luckily covered with hard snow, making the going easy. It was on the lateral moraine, where there is a flat stony place with a stream running by, about three miles from the pass, that Bakshi bivouacked his force. This spot is therefore known locally as *Bakshi ka Bas*. Passing two or three small glaciers on the right, off which an icy wind was blowing, we soon reached the foot of the final ascent, which was tedious owing to the height, but not difficult. After a steep ascent the slope graded off more gently for the last few yards into a bank of snow and shingle within the notch, through which appeared the snowy summits of Tangir and Darel. Quite suddenly we reached the bank to find that on the far side there was an almost sheer drop of a thousand feet to a large snow-field. Instinctively I drew back.

The view was somewhat restricted by the walls of the notch and to the south-west by the snowy ridge, about 20,000 feet high, at the head of the Chichi Nala. But to the north-west there was a fine view of the glacier descending steeply from the snow-field to the Toshi Nala, of the Fasat ridge to the left, and of the mountains and valleys of Chilas. We were at the summit of the pass easily and without any trouble by 9 o'clock.

The steep snow-slope from the pass down the other side must have been well over sixty degrees near the top, and would have necessitated careful work with the ice-axe. The local man told me however that "Mahmuli Lat Sahib," as they call Mummery, here strapped on his crampons, sat down on his hunkers and slid down, presumably stopping himself with his crampons and axe lower down, for there is a sheer precipice of about a hundred feet at the bottom. A very pleasant way of getting down for anyone with nerve !

That was in 1895. It was further round the mountain, on its north-western or Diamarai face, where Mummery and the Gurkha, Raghubir, about whom the locals are never tired of talking, reached a point over 20,000 feet on the mountain, after most difficult and strenuous climbing. Raghubir was taken ill and the two had to descend. It was still further round towards the north, when attempting to cross to the Rakiot face, that Mummery with two Gurkhas must have been swept away by the fatal avalanche. They were never seen again.

Mummery held that the south face was impossible ; he never saw the Rakiot face. It is possible that if the Gurkha had not gone sick they might have climbed the mountain from the Diamarai side. That was over thirty years ago, and they have never been avenged !

NINE DAYS' SPORT ON THE PAMIRS.

(Being extracts from the diary of a journey to Chinese Turkistan in 1927.)

CAPTAIN A. A. RUSSELL.

THOUGH the reading of a diary must always have more interest for its author, to whom the record of each day's adventures brings back scenes and emotions which can never be properly conveyed in words, yet a story, written on the spot, even if it is not a gem of literature, must surely give a truer picture than an account written some time afterwards. A brief introduction to the people mentioned is necessary.

Nadir Beg belonged to the British Consulate-General at Kashgar. Major Gillan, the Consul-General, very kindly placed his services at my disposal. Nadir had previously been with the Roosevelt and Morden expeditions and had got an utterly false idea into his head that he was a shikari.

Aibash was a local man of Subashi who, like Nadir, imagined himself a shikari. No one knew less about the game. I called him "Eyewash."

Abu Khan was a local man of Kara-su and the only one who knew anything about shikar. He was unfortunately imprisoned by the Amban of Tashkurgan for allowing some smugglers to cross the Russian border. The Amban had given strict orders that no one was to cross the frontier while I was in the vicinity.

Sohbat Khan was a Yusufzai Pathan of the Guides Infantry, whom Major Sandeman very kindly arranged to let me have. He and Ilyas Khan, my Pathan servant, were treasures.

Tuesday, 19th July. Started off from Sarik-Kara Su with Nadir and Abu Khan on yaks at 3-30 a.m. The plan was to go along the hills, climb the high one, 16,142 feet (38°22' N., 74°51' E.), overlooking Tok-terek, and then descend to the new camping-ground in Tok-terek nullah. The baggage was to go by the path starting at 8-30 a.m.

At 6-30 a.m. we commenced to climb the big hill—about two thousand feet of very steep and difficult going. We got to the top

about 10 o'clock. It was deep snow here. The view was truly magnificent. In every direction an endless vista of snow-clad mountain peaks. There was a slight haze, but still one could see about seventy or eighty miles. I took my bearings and set my map on a flat rock. Looking west and north-west into Russian territory I saw the Kaufmann peak, 23,000 feet,* and Kizil Aghin peak, 21,420 feet beyond the Great Kara-Kul, and the Balauti peak beyond Murghabi, the Russian Pamir Post on the Murghab, about forty-five miles to the west. Murghabi is connected with civilization by a telegraph line. I felt a great desire to see how life in a Russian frontier post compared with that in ours, but it could not be. To the south-west I could see the peaks of the Great Pamir above Lake Victoria on the Afghan border, and to the south the Hindu Kush, looking quite insignificant amongst all these giants. Looking east, the great mass shown on the map as the Kashgar range rose up before me; to the north-east is Kungur, 25,140 feet, beyond which lies the Gez river route, a dangerous journey through stupendous canyons. It is said to be impossible at this time of year, yet the dak-runners still go that way, as it is the most direct route to Kashgar from Tashkurgan. Due west the entrance to the Kara-tash pass, 16,338 feet, could be seen; this was my way to Kashgar; it looked very inhospitable. To the south of the Kara-tash and much nearer was Muztagh Ata, the "Father of Ice-Mountains," 24,388 feet. It stands alone and seems to dominate the whole world. The local inhabitants say that it is the haunt of demons.

Away below us we saw the camp—it had arrived sooner than I expected. Abu Khan spotted a herd of poli in the distance—he has the most wonderful eyesight and generally spots things long before anybody else. As the wind was favourable and the poli were in a fairly get-at-able place, I determined to try and stalk them. It was a long and difficult stalk taking five hours—and then I had to give up, as the wind, that fickle companion, changed right round and blew down the valley straight towards the quarry. I turned and fled.

One phase of the stalk was most exciting. I was working my way down the edge of the stream when two ewes appeared about

* Now known to the Russians as "Peak Lenin." Its latest height value is 23,392 feet. The first ascent was made in 1928 by a party of climbers of the Russo-German Alai-Pamir Expedition who reached the summit by the eastern arête (*Deut. Forschung*, Vol. 10, 1929). The latest height value of Kizil Aghin is 21,325 feet.—ED.

200 yards on my right front. There was no cover ahead and I had to pass them. If they spotted me where I was they would run straight down and alarm the big fellows. I crawled on my stomach inch by inch for what seemed an eternity, but was really about an hour. Every time one of them raised her head I lay like a rock, till after satisfying herself that I *was* a rock, she went on grazing. In this way I passed within forty yards of them. Then I got up and walked on. It was ludicrous to see their surprise ; but I had ceased to care, for I was between them and the ones that mattered, and as soon as the "ladies" had recovered from their shock, they scampered off in the opposite direction. Later I found myself in a somewhat similar position—a herd of small rams on my left front and a large herd of ewes with young ones on my right front. I waited for two hours till they had grazed their way to a safe distance.

Having found Abu Khan, after giving up the stalk, I hastened back to where Nadir had brought down the yaks. Abu Khan said it would be best to go over the *Kotal* to the right and round the big hill as there was a lot of snow on the direct route and it was getting late. The route we chose turned out to be very bad ; we scrambled up and slithered down the most terrifying mountain-sides. Those yaks were marvellous—one would not have thought it possible for anything but a goat to have gone over such ground. We got in at 9-15 p.m. about an hour after dark. The men were greatly relieved to see us.

Wednesday, 20th July. Had a "Europe morning" this morning. Started off at 10 o'clock for the ridge overlooking the *jilga* where we tried so hard yesterday, intending only to see if the herd was still there. The yaks were very bad and we had to climb the last three-quarters of a mile on foot. I was just clambering over the ridge to get a view into the nullah when I spotted our friends lying on the edge of the snow not four hundred yards away. Nadir, who was labouring up behind, very nearly blundered into it. I intimated to him with a significant gesture that I would have had much pleasure in cutting his throat if he had scared them off. However, the animals were still there when I looked again and I commenced the stalk straight away. It was a simple matter to get within two hundred yards but impossible to get nearer than that, so I collected my wind, took a careful aim at the biggest, fired, and had the mortification to see my bullet strike the snow a foot short. I seized the bolt to reload and the cartridge jammed. I struggled with it and in about thirty seconds got it out, bent nearly double. The poli had disappeared, so I hastened to the spot where I saw them last and found them collected

in the nullah below. I fired four more shots at the biggest and brought him down at 400 yards. Nadir and Abu Khan told me afterwards that they thought I would break my neck the way I went hurtling down the hill-side after those poli. Within about three minutes of the death, the birds of prey appeared circling high above us, watching and waiting. We only took the head and skin, as the yaks were far too feeble to reach this spot. It was not much of a head, 44 inches, but it was a beginning. We got home at 7-30 p.m. and I told them they could *halal* a sheep to celebrate the occasion.

Thursday, 21st July. Spent the morning skinning and dressing the head. A crowd of local Khirghiz collected and took a deep interest in all the proceedings. After lunch I struck camp and marched to Tok-terek North. Saw several quite good poli on the way but my rifle was with the baggage some way behind and they would not wait. Had to bring a second *akoi* (Khirghiz tent) here for the Begs and the yak-owners, as there is no habitation within miles. I asked the Subashi Beg why he did not bring a couple of cow yaks for milk and he explained that only women knew how to milk a cow. I offered to teach him, but he was not having any.

The men have at last learned to pitch my tent properly. They never seemed able to get the pegs in the proper alignment. Nadir, the other day, when I pointed out that the canvas would certainly tear with the pegs as he had put them, protested that his life would be forfeit if it did. My remark that my tent was infinitely more valuable than his paltry life filled him with admiration.

Friday, 22nd July. Set off on foot at 5-15 a.m. with Aibash, the new local man. To-day was merely a reconnaissance up the Tok-terek *jilga*. We had gone about two miles when we were both startled by a plaintive bleat close behind us. This was the Beg's pet lamb which had broken loose and followed us. It had to be caught and tied up somehow or else we had to go home. There followed the funniest scene imaginable. Aibash, who looks exactly like Grock, went through all sorts of strange contortions, sometimes crouching like a Japanese wrestler, sometimes on all fours making a noise like a hubble-bubble; but always just as he was about to grab the beast, it skipped out of reach. I am afraid I did not assist much: I was helpless with laughter. At last with a lightning dive Aibash grabbed it by the hind leg. We tied it up and spread a red cummerbund near it to frighten off any beast of prey that should come prowling round. After this interlude we proceeded on our way. About a mile further on I was much annoyed to find the Beg's camels and yaks grazing in a

most promising part of the *jilga*, while further on at the head was another herd of yaks.

Saw nine poli up a side stream but only two were any size and they were no bigger than the one I had shot : so I left them and came home. Somebody had come and fetched the lamb in our absence.

Sent Nadir and Aibash off the way we came yesterday to see if they could spot anything. Nadir reported that they found nine poli not far off, but could not tell their size.

A chilly night ; the wind rising and the clouds coming low on the hills. How nice to be comfortably ensconced by a cheery English fireside instead of in a wee tent on the bleak mountain-side !

Saturday, 23rd July. Set off at 4-30 a.m. on yaks up the nullah where we saw some poli on Thursday. Found nine on a very difficult bit of ground. The approach which offered the best chance of success was straight up the ravine below them, but the wind would not allow of this. I waited three hours for it to change but as it showed no signs of doing so, I decided to go up the opposite side of the shoulder. Half-way up the wind veered, so I then tried to get right above them ; but it was no good, the devil was in the wind to-day—it started blowing in the opposite direction. It was too late to turn back and I went on in the faint hope that the wind might have eddied off the place where the poli were ; but it had not, and when I finally peered over a rock, there was no sign of them.

As Aibash and I were labouring up the hill I spotted four big poli on the hill opposite. On continuing our climb they spotted us and the last we saw of them was disappearing over the sky line. To add to our misery it began to snow.

Found some magnificent primulas, with a scent like primroses, and brought a large bunch home.

Sunday, 24th July. Another early start. Got off just as the light was beginning to come over the hills. The higher ground was all covered with snow but most of it had melted down below. About two miles from camp we blundered into four poli feeding low down. Needless to say, they were off like the wind. I have come to the conclusion that Nadir and Aibash are worse than useless. They boost along on yaks making the hell of a noise and suddenly stop and point out a herd of poli more often than not disappearing over a mountain top. Neither know how to make use of the wind.

Came across a young poli about three or four days old. It had overslept itself and did not wake up till we were quite close. It trotted off bleating like a lamb in response to Aibash's life-like imitation.

The Subashi Beg whom I had sent off for *khobar* came back this evening and informed me that no poli had been seen and all the nullahs round about Subashi were full of Khirghiz flocks. I sent him off with a flea in his ear and told him to try again. The local Sarikoli appears to be singularly lacking in initiative and quite incapable of any effort.

Monday, 25th July. Took the bivouac tent, bedding and tiffin basket, and camped at a spot about four miles up the *jilga*. The place I chose was about half-way up a little side nullah in a bend well sheltered from all sides, and by going about fifty paces up the hill-side one could get an excellent view of all the nullahs coming into the main basin of Tok-terek at this point. On the way up we saw several herds of poli, but all the animals had small "heads" or were females, except those in one large herd which I spotted away up the biggest of the subsidiary nullahs. It was too late to stalk them as the wind had already changed. The time-table seems to be as follows: From 3-45 a.m. to 5-45 a.m. it blows down the nullahs, from 5-45 to 6-15 there is a lull, and from 6-15 it either veers right round or chops and changes in the most bewildering manner.

We watched that large herd of poli all day—I counted thirty-two animals, of which twelve were big "heads"—one exceptionally big, I should say at least sixty inches. I looked at him longingly and my mouth watered. In the evening they came down the nullah and, with the last flicker of light at 7-30 p.m., I saw them reach the hill-side opposite us. Knowing that they would lie up somewhere near there for the night, I planned to stalk them next morning from the dry bed of a hill torrent which came down about 300 yards to the east and below where I last saw them.

Aibash and I did not get much sleep that night. It was snowing and bitterly cold. I dared not light a fire as the poli were in the only place from which the camp was visible.

Tuesday, 26th July. I rose at 2-30 a.m. and set off alone at 3 o'clock. It was difficult picking one's way amongst the boulders in the pitch darkness and I had to be particularly careful not to knock my rifle. I reached the place in the dry bed of the burn that I had fixed on the evening before just as the first grey light turned the world into ghost-land. I crouched breathlessly peering into the half-light, imagining every rock was a poli, a leopard or a bear. Suddenly I saw a shadowy object on the hill-side about 200 yards above me and up wind begin to move. It came down the sky-line, a poli. Then followed a procession, sometimes a single one, sometimes three or four—every one silhouetted against the sky as he passed. It was too dark to

distinguish the big fellow and I waited until they had all passed—about a quarter of an hour—then crept down and across to a little spur overlooking the nullah where I heard stones rattling about. Knowing that there was good grass there I felt I really had the old man this time. On peering over I found that instead of feeding on the rich grass they had gone a little way up the opposite hill-side and were already out of safe range. At the same time I was horrified to see a black figure stalking along the same hill-side straight towards them! It was that prince of fools, Aibash, who had come out to see the fun. I was powerless to warn him and I knew that if they did not spot him they were bound to get his wind. So I just waited and watched the tragedy. Aibash got to within about 80 yards of them before they got his wind. He never saw them till they were about three-quarters of a mile away, when he waved to me frantically to inform me of his great discovery! When he eventually came down I told him in mixed Persian, Pushtu, Hindustani and English, what I thought of him. But as he only speaks Turki, in which language I don't know a single swear word, I'm afraid a great deal of it was lost on him. Poor old man! He may have been a famous shikari once—which I can scarcely believe—but since he married three wives I am afraid he has lost his prowess on the hill. I think the cold last night may have numbed his brain. He dithered all morning, left my camera in one place and my waterproof in another, and jolly nearly set my tent on fire fooling about with the candle-lamp.

After the herd was alarmed it split into two—a few smaller ones going up a side nullah and the big ones going up the one they came down yesterday. I followed them for a bit, but the wind changed and I had to give up. However I spotted them later in the morning, away far up, also another lot with some quite shootable heads on the hill-side down the main valley. So I have decided to remain another night, but Aibash is to remain in the base camp and Sohbat come in his place. I left Nadir, who arrived with the yaks at 7 a.m., two hours before he was due, to watch the herds with the telescope, and came down to my base camp for a bath and hot meal.

On my return I went up the hill-side with Sohbat to where Nadir was. He had lost sight of the big herd, but, as we were looking round, the four that had been lying up on the hill-side came down to the stream. The wind was a little uncertain, but I decided to go straight for them. It was a short and exciting chase. I got to within 80 yards of them, dropped one just as they were moving off and another 400 yards away in the stream. The first, I regret to say, was smaller

than I thought, and I decided not to keep the head though the Khirghiz took the rest with the greatest of pleasure. The second was not very much bigger—42 inches—but I kept him in case I failed to get a better. Sohbat enjoyed the tamasha hugely—he saw the whole show from the hill-top.

When we got back to the tent we saw a large herd looking at us from the top of the ridge overlooking the camp. I did not see any worth shooting though Nadir swore there were some. After Nadir and the Khirghiz had gone with the yaks, Sohbat and I were making tea when we suddenly found ourselves invaded by two-humped camels. Sohbat got up and clapped his hands and they galloped off, their great ungainly bodies going up and down like boats on a rough sea. These brutes are half wild. The Khirghiz leave them to graze in these out-of-the-way *jilgas* for months on end and the sight of the tent and the fire was evidently too much for their curiosity.

Wednesday, 27th July. Got up at 2-15 a.m., made some tea and boiled a couple of eggs—a vast improvement on yesterday's cold fare! Started off at 3 a.m. and walked as fast as I could in the dark, getting about three-quarters of the way up the nullah where the big herd was yesterday, before the light came. I then proceeded to search the ground with my glasses, but saw not a sign of the poli. When it got lighter I went on and found all the tracks leading up the left of the three upper nullahs, and over the watershed into Russian territory. I could not make out what had driven them away—my shots yesterday evening were too far off to be heard here. Searching round I found the tracks of a yak coming down the middle nullah only a short distance and then returning. The tracks were last night's and I believe this was another of the "Bolo's" spies sent to see what I was doing. The same happened at the last place—only that time we saw the man. He was on a yak, came just over the border and then returned—no apparent reason at all. I should have very much liked to catch one of the lads and send him down to the Amban. My friend would have eaten him alive.

On returning down the big nullah I suddenly spotted a large herd crossing in front of me. There were some quite good-looking heads amongst them. The wind had fortunately changed, so I waited till they had got behind a shoulder and then doubled forward for all I was worth. Unfortunately I had not seen some ewes which had not yet crossed the nullah, and these, as soon as they saw me, gave the alarm to the main herd. I had two snaps at the biggest I could see and laid him low; but it was a marvel I hit him as I had not an ounce

of breath left in me. He also did not have much of a head—42½ inches.

When Nadir arrived with the yaks at 8-30 we packed up and marched down to the base. After a short rest there we marched to Subashi, arriving at 5-30 p.m. The Subashi Beg was most attentive. Not having found me a good head I suppose he wanted to try and make up for it. He led me to a very superior *akoi* where his wife gave me tea, mostly cream, and fried cakes.

To-morrow we start for Kashgar.

THE MUZ-ART PASS IN THE CENTRAL TIEN-SHAN.

LIEUT.-COL. REGINALD SCHOMBERG.

THE Muz-art pass is the chief artery for traffic between the cities of Chinese Turkistan, south of the Tien-Shan, and the important trading city of Ili or Kuldja. The pass is well known to travellers, particularly big-game hunters. An account of a crossing of it early in the year may therefore be of interest. Strictly speaking, it is never closed, and is used throughout the year, though stress of weather may make it impassable for one or two days at a time.

I crossed the Muz-art on the 8th April 1929. Two days before, coming up the valley, we had been delayed by a snow-storm, but the weather cleared, and we had a perfect day for the crossing. Leaving Tamgha-tash, at the foot of the glacier leading to the pass, at half-past four in the morning, we reached the head of the glacier at 11-15 ; as the distance is fourteen miles, the time taken may be considered good. This point is called "Ishparlik," as it is here that mountain sickness is said to begin. The ponies had to be "man-handled" in two places only, where steps had to be cut in the ice. The numerous crevasses, however, caused considerable delay, and entailed most wearisome detours.

The head of the glacier is not the crest of the pass, for a short steep zig-zag ascent over shale ascends from it for four hundred yards to an almost level area between low hills. The track ascends very easily along this for about two and a quarter miles to the summit. This nearly level stretch was covered with snow, from eight to ten feet deep, with a very narrow path traversing the centre of it. If an animal or man stepped a few inches off this beaten track, the snow engulfed him at once and it was a hard task to dig him out again. No Turki has ever any thought for anyone except himself, and consequently caravans were always meeting here, with a resulting head-on collision, followed by a panic among the animals which floundered and plunged, as they sank deeper into the fine dry snow. Victory went to the strong, and it is regrettable that firm selfish ramming forced the weaker caravans off the narrow path that led to ease and safety.

The pass is certainly not difficult in itself. The ascent from the south is steady but nowhere severe, the glacier is merely a nuisance, but the wind is dreaded by the caravan-men, as dangerous storms come on, though a rapid descent is made into the northern valley. This pass has one enormous advantage : there is never any danger from avalanches, as the steep mountains cannot hold the snow. Apart from storms, the crevasses are the chief danger, though the numerous casualties amongst the animals are due far more to bad condition and overloading than to the gradient, difficulties or dangers of the road. Donkeys are the chief sufferers, as they form the chief means of transport. Camels cannot be used, though they bring goods to the foot of the pass, where a huge heap, suggestive of a commissariat dump, is made—to be brought over the pass later by donkeys.

We took altogether nine and a half hours to reach Khan Yailak, over the pass from Tamgha-tash, a distance of twenty-five miles. This was very good going, but it is usually better to halt at Toghra Su, at mile 20, immediately north of the pass, where there is wood, grass and water.

EXPEDITIONS.

A VISIT TO WESTERN TIBET, 1929.

A MOST interesting journey was performed during the summer of 1929 by MR. E. B. WAKEFIELD of the Indian Civil Service, in the course of his official duties as British Trade-agent for the year. The journey occupied almost exactly five months and four-fifths of this period were actually spent in travelling. Barometer readings have not yet been checked, and heights given are approximate only. The numbers in brackets after each place denote the distance in miles covered from the start.

Wakefield's party started from Simla on 4th June, and following the Hindustan-Tibet road, eastwards up the Sutlej, reached Pooh (192) on 20th. Here the party divided, and while the main body proceeded east to Gartok by the usual trade-route, taking with them most of the baggage, a smaller party, eight men in all, left Pooh on the 24th, to make a longer circuit. The route followed is one which is commonly used by Bashahri traders, whose transport animals—sheep and goats—find good grazing on the high mountain slopes which have to be traversed.

The track crosses to the right bank of the Sutlej, below Namgia (202; *Map* 53 I), and, after a steep ascent over one of the western spurs of Leo Pargial (*Map*, Leo Purguil, 22,227 feet), follows the left bank of the Spiti river to Shalkar, close to where this river is joined by the Pare Chu. The Pare Chu was followed as far as its junction with the Sumgil Dokpo (*Map* 52 L, Sumkhel Chu), whose banks were now followed to Samlakar (265) in Chumurti. Wakefield arrived at this point on 2nd July, and on the following day crossed the Bodpo La (*Map* 52 P, 19,412 feet). Conditions were very bad, and partly owing to the cold, partly as a result of the height, several members of the party collapsed. It was impossible to halt at Lungorma (274) for more than one night, and on 4th July the party pressed on over the easy Himi La (*Map*, Imis La) into the Ladakhi province of Hanle, and camped in the sheltered valley of the Shel-shel Dokpo. A halt of four days was made here, in order to give the party time to recuperate from the effects of the Bodpo crossing, but unfortunately one of the Gurkhas failed to recover and died.

Wakefield spent one of these days in climbing the Pong Da mountain (about 20,000 feet). On 9th July the party set out again and after crossing the Nerbud La, came down again into Tibetan country. From this point traders generally make north to Bemkhar, descend into the Indus valley from there, and follow the river south-east to Demchok. Wakefield, to avoid this detour, after a day spent in preliminary reconnaissance, found a way through the barrier of mountains to the south and came down to Debo-che, with the intention of getting on to the route traversed by the explorer Kalian Singh in 1867.* The map is however extremely sketchy and apparently the Charding pass no longer exists. Wakefield therefore crossed the Sershang La (which is sometimes used by travellers between Debo-che and Tashigong) and approached Demchok (347) from the south-east. The Indus was crossed without difficulty two miles below Demchok, and four long but easy marches brought the party to Littledale's route in the neighbourhood of Rudok (425; *Map* 52 O). Here Wakefield was fortunate in finding an enlightened, well-educated and most hospitable *dzong-pön*, who had been educated at Rugby School in England and spoke excellent English.

The journey of 150 miles from here to Gartok (575) was accomplished in eight days. The Indus, which had risen some three and a half feet since the party crossed it below Demchok, was re-crossed with the greatest difficulty opposite the monastery of Tashigong, Wakefield himself swimming the flooded river four times with loads. From this point to Gartok (*Map* 62) the track, which follows the Gartang Chu, was well-defined and easy.

Wakefield's party left Gartok for Tuling (*Map* 53 M, Totling) on 5th August and crossed the range of mountains between Gartok and Dunkar (615) by a hitherto unknown pass called the Sazi La (about 19,200 feet). While the rest of the party were crossing the pass Wakefield himself climbed the mountain known as Sazi (about 20,000 feet). The track from Dunkar to Tuling (634) on the banks of the Sutlej, is easy. From Tuling Wakefield marched south-east via Daba (660) to Gianima (732; *Map* 62), which portion of his route is largely

* KALIAN SINGH, the "third pandit" of the Survey of India, or G. K., executed a route-traverse from Demchok *via* the Charding pass, Debo-che, Medokding to Totling (Tuling), in 1867. Henry Strachey had already traversed the route from Totling to Medokding (*Records Survey of India*, Vol. 8, pt. 1) G. K.'s roughly observed latitude for Debo-che was 32°30' 13.1". His longitude was 79°24'.

unmapped, and thence continued to Taklakot (780) on the banks of the Karnali river.

After halting a few days at Taklakot, the party turned north-east, crossed the western slopes of Gurla Mandhata (25,355 feet) and descended to the shores of Rakas Tal. Then they made northwards along the ridge separating Rakas Tal from Lake Manasarowar,* crossed the channel (deep and fast-flowing after recent rain), which discharges Manasarowar's surplus water into the neighbouring lake, and joined the main Lhasa-Leh trade-route at Barkha (844). From here they followed the route traversed by Ryder and Rawling in 1904, via Minsar to Gartok.

A heavy fall of snow delayed the departure from this place; but it was finally quitted on 27th September. Wakefield's route, the one normally followed now by traders, differed in the first few stages from that taken by previous European travellers. He crossed a high pass known as the Jongchung La, about eight miles to the east of the pass of that name marked on the map, and joined the normal route beyond the Lao-che La (18,500 feet). Thence the track goes almost due west, crosses the Shirang La (16,500 feet), and comes down to the Sutlej at Tiak (1084).

Having crossed the Shipki pass into British territory on 11th October, Wakefield halted for a week at Pooh (1115), whence he reached Simla (1305) on 2nd November.

* Lake Manasarowar was first visited by Europeans, Moorcroft and Hearsey, in 1812. These two travellers, disguised as fakirs and under the assumed names of Mayapuri and Hargiri, after reaching the lake, were discovered and imprisoned by Tibetans at Daba Dzong, some eighty miles to the north-west. They were released by the interposition and on the security of two Indians, Devi Singh and Bir Singh, of Milam, the father and uncle of Pandit Kishen Singh, the famous explorer A. K. of the Survey of India records. Henry Strachey visited the lake in 1846; his brother Richard Strachey and J. E. Winterbottam in 1848; in recent years Ryder in 1904, Longstaff in 1905, and Brigadier R. C. Wilson in 1926. Henry Strachey found the stream connecting the lakes 100 feet wide, 3 feet deep and running swiftly from east to west. Ryder found a small stream partly frozen over which issued from a hot spring, the channel between this spring and Manasarowar being dry; but he was told that from about June to September the channel contained running water from Manasarowar to Rakas. Longstaff and Wilson found the channel dry except for occasional pools; it was apparently blocked by a shingle bar. Wilson considered that at the time of his visit, 19th July, 1926, the two lakes should have been full, and therefore if either ever over-flowed into the other it should have been doing so at that time. It is therefore of considerable interest that Wakefield finds the stream in the channel "deep and fast-flowing after recent rain" in September 1929 (*Geographical Journal*, Vol. 71, p. 439).

SAMLAKAR AND THE BODPO LA, 1929.

A MEMBER of the Club contributes the following note on a portion of a journey recently carried out by him and his wife.

Chumurti can be reached from civilization by two routes which converge on the Pare Chu at Chusa (*Map* 52 L), the river here forming the undemarcated border between Tibet and Bashahr. At Chusa there are hot sulphur springs issuing straight from the rock into round stone basins, large enough to provide an excellent hot bath for those in need of such a luxury. They are famed for their medicinal virtues, each bath being set aside for some particular disease.

The road continues for two short marches up the Pare Chu and then turns right-handed towards Samlakar and the Bodpo pass. This nullah is particularly beautiful after the semi-desert country round Chusa. On nearing Samlakar the country opens out to downs very similar to those of Rupshu and Hanle province. Tun-tun, at 13,700 feet, is the last village, and beyond it one must camp until Tashigong is reached.

Samlakar is famed for its grass, and not unjustly. As it is the camping-ground under the Bodpo La, most *beparis* halt here for a day or two to strengthen their animals for the crossing or to recuperate them after the effort.

The height of Samlakar is 16,550 feet (hypsometric), and there is a long pull-up to the top of the pass at 19,810* (aneroid). The height is the great difficulty, and since there is no grazing, great numbers of sheep and goats die of exhaustion. The country in the vicinity contains many wolves which prey on the victims of the pass.

The Samlakar area is very good for game. There are few ammon, but burrhel abound, sometimes as many as half a dozen herds being visible at one time. The heads are magnificent, and nothing under twenty-five inches is worth shooting.

LIEUT.-COL. SCHOMBERG'S JOURNEYS IN THE TIEN SHAN
AND ALTAI, 1927-29.

A BRIEF outline of COLONEL REGINALD SCHOMBERG'S recent journeys has reached us just before going to press. Schomberg travelled up through Gilgit to Kashgar in the autumn of 1927, mainly with the object of exploring those regions of the Tien Shan and Great Altai which are shown so inadequately on existing maps. The Survey

* Mr. Wakefield gives the height as 19,412 feet. The pass has not been fixed by regular survey.

of India⁷ maps stop short at latitude 40°; and the War Office maps, on the scale of 1 : 4,000,000, are hopelessly out of date and show neither Sir Aurel Stein's nor recent Russian surveys.

Leaving Kashgar in September and travelling via Kelpin, Uch Turfan and Aksu,* Schomberg stayed for a while in the hills to the south-east of the Muz-art pass. Conditions at this time of the year are most unfavourable even among the southern spurs of the Tien Shan, and the rigours of a Central Asian winter here are calculated to chill the ardour of the most enthusiastic. The old bogey of haze, the curse of all travel north of the Kun Lun, exceptionally bad as it is in the southern Tien Shan, is not laid by the cold of winter. Fine days are not uncommon, but a week of good weather is very rare. On reaching Urumchi in early February, conditions were found to be even less propitious for travelling in the mountains. Schomberg therefore travelled east to Hami (Kumul). On his way back from that place, signs of spring lured him into the Barkul mountains, and a very interesting and new crossing of this range was made by the Tuga Dawan. Though it was only the end of February, the pass was crossed on a perfect day. The passage of the snow on the northern side of the pass was most laborious, for his party was the first to cross.

Returning to Urumchi, Schomberg left that grimy town at the end of April 1928, and took the road, first to Manas, and then across the desert to the Great Altai mountains. It was May when they reached them and conditions were perfect for travelling. Although so much further north than the Tien Shan, and with an almost Siberian climate, the Altai were remarkably free from snow. After visiting the Kanas lake, which feeds the Burchen, one of the chief tributaries of the Irtysh, Schomberg travelled through the Saur, Barlik and Kara Adyr mountains to the Urta Saryk valley, of which he gave a brief account in the last *Journal*.

The mountains that form the Russo-Chinese frontier are not interesting to the climber and offer rather disappointing scenery. There is no snow on them, or very little, during the summer, and fine pastures are their main characteristic.

* We may be wrong, but we prefer *Aksu* to *Aqsu*. Mr. Rickmer's witty remarks in the *Alpine Journal* are very much to the point. No self-respecting Turki uses a guttural 'K,' and none, or very few, would be able to say whether a 'Q' or a 'K' should be used. We have no objection to using 'Q' in Arabic or Persian, where even an untrained ear can detect the guttural, but for Turki words we intend to follow the spellings given in the very full *Index to Local Names* prepared by Sir Aurel Stein in his *Memoir on Maps of Eastern Turkistan and Kansu*, which is being followed by the Survey of India.

On reaching Ili in July 1928, Schomberg hoped to travel through the Tien Shan by the Kash valley and to come out at Manas. With no guides, extremely poor maps and no help from the local nomads—to whom walking anywhere and travelling amongst high mountains are alike detestable and senseless—he emerged much further west of Manas than he had intended.

Schomberg observes that travellers in the Tien Shan are much handicapped by what he calls the shortness of the exploring season. Winter stays long and goes late ; and it is only from the end of June to mid-September that any travel in high altitudes can be carried out. As it was, in 1928 there was no autumn, and winter came in early. Schomberg himself had great difficulty in getting to Manas at all ; and Captain George Sberiff, a month later, but much further south, lost all his caravan and nearly his life in crossing the lower passes of the Tien Shan, north of Kuchar. It will thus be observed that the only suitable time for climbing is when the rivers have run down and the first snows have come ; and this is but a brief period of perhaps six weeks.

Returning from Manas to Urumchi and passing through the interesting Kuruk Tagh,* Schomberg reached Yarkand in January 1929. Owing to the world-wide severity of this winter, the lower foothills of the Kuen Lun were quite impossible for travel, which was unfortunate, as normally the late winter is a good time for visiting them. He left Kashgar for the north again in March 1929 and crossed the Muz-art pass early in April. A short note on this crossing appears in another part of this Journal.

Being unable to obtain any reliable information concerning the climatic conditions of the Central Tien Shan, he left Ili on 23rd April intending to go up the Kunges river, thus completing the exploration of the heads of the Kash and Kunges rivers. From here he planned to reach Urumchi by the Dunde Kelde pass ; this however he failed to do. On crossing the watershed of the Kunges, winter was still present in the head of the Yulduz valley. Nevertheless, after groping his way for some days in daily snow-storms, and experiencing much trouble from lack of grass and fuel, he arrived rather the worse for wear at Toksun. From here he went again to Urumchi, whence he once more crossed the Tien Shan, this time by the Tengri pass ; and taking the various passes on the summer track to Kuchar, he

* An interesting note on " River changes in the Eastern Tarim Basin " by Lieut.-Col. Schomberg is printed in the *Geographical Journal*, Vol. 74, p. 574.

reached that place in August and Kashgar in September. He finally left Kashgar for India on the 19th of that month, after spending two years in Central Asia.

The exploration of the Tien Shan has been much neglected in the past. Schomberg explains this neglect by emphasizing the adverse climatic conditions, about which Merzbacher complained so bitterly in his *Central Tien Shan*. The detailed account of Schomberg's travels should therefore add greatly to our geographical knowledge of those regions and will be awaited with very great interest.

THE ITALIAN EXPEDITION TO THE KARAKORAM, 1929.

IN the last volume of *THE HIMALAYAN JOURNAL* we gave a brief résumé of the preliminary expedition of H. R. H. THE DUKE OF SPOLETO, which was undertaken to collect and store supplies at Askole, the furthest village up the Braldoh. The objects and organization of this year's expedition were also given, and it was briefly stated that the members taking part had left Srinagar in three parties, on the 27th and 30th March, and the 3rd April.

By the middle of May the whole party was concentrated at Ordokas, at an altitude of 13,900 feet, 17 miles up the Baltoro glacier from its snout. The base camp was established here, on the site of the depot formed in 1909 by the Duke of the Abruzzi, the uncle of the present leader. After a brief period of bad weather a preliminary reconnaissance was made to the summit of the East Muztagh pass, crossed with so much difficulty from the north by Sir Francis Younghusband in September 1887 on his famous journey from Peking to India. The Muztagh pass has not been crossed since, though A. C. Ferber and E. Honigmann reached the summit from the south on 29th September, 1903 (*Geographical Journal*, December 1907, p. 630).

This reconnaissance proved the pass to be practicable, and a party under the leadership of Sig. Umberto Balestreri, and comprising the geologist, Professor Ardito Desio, Vittorio Ponti and a Courmayeur guide crossed it at about 19,030 feet, to the Sarpo Laggo glacier and the middle Shaksgam valley. A topographical sketch was made of this valley, which was followed as far as the left bank of the Kyagar glacier. Details of this journey are not yet available; but from a letter received from Commander Mario Cugia, it appears that the snout of the Gasherbrum glacier reached the Shaksgam river, which flowed under the ice; the snout was therefore in much the same position as when it was passed by Sir Francis Younghusband forty years before. Ponti returned before reaching the Urdok while the

rest of the party went on till they effected a topographical junction with the Survey of India cairns erected in 1926 on the ridge east of the Kyagar glacier. No attempt was made to cross this formidable obstacle, owing to shortage of supplies, and as yet we have no report as to its practicability. The general lie of the side tributaries of the Shaksgam as shown in the map at the end of Volume XXII of the *Records of the Survey of India* is reported to be approximately correct. These were inserted from Sir Francis Younghusband's report fitted in with the stereographic survey of the ridge summits from stations east of the Kyagar. The Kyagar glacier is also reported to block the Shaksgam valley completely, as in 1926.

Meanwhile another party under the direct command of the Duke, ascended the main Baltoro glacier to Concordia, the junction of the Godwin Austen glacier, descending from K², with the main trunk from between Gasherbrum and the "Golden Throne" of Sir Martin Conway's 1892 expedition. The Duke with two climbers reached a height of about 22,000 feet, from which point they could recognize the "probable saddle" mentioned by Sir Martin Conway. It seems likely that there is a way over the head of the Baltoro glacier to the Urdok glacier, but details are not yet available.

At the end of July the expedition left the Baltoro glacier. A geological party under Desio explored the Trahonge glacier, the second tributary to the Baltoro from its snout on the north bank, with the object of trying to make another pass to the Sarpo Laggo glacier; but this object was not attained. They also explored and made a topographical sketch of the Punmah glacier, which was first explored by Godwin Austen in 1861.

Besides the main objectives of the expedition, namely the crossing of the Muztagh pass, the exploration of the middle Shaksgam, and the examination of the head of the Baltoro glacier, much valuable scientific work has been accomplished. A complete stereographic survey has been made of the Baltoro glacier, and topographical sketches have been made of the middle Shaksgam valley and of the Punmah glacier. Observations were made at Ordokas to determine the rate of flow of the Baltoro glacier. In this connection Cugia records that some traces of the Duke of the Abruzzi's expedition at Concordia were found not far from the point where they were left in 1909, which would indicate very slow movement at this point. But it must be remembered that at the junction of glaciers ice-swirls and eddies are possible, and such a locality is by no means a favourable spot at which to estimate velocity. Pendulums were compared at Dehra Dun

before the commencement of the expedition, and gravity determinations were made with them by Cugia at Ordokas, Askole and Shigar. Magnetic observations were made at Ordokas, Concordia, Paiju Askole and Dassu. The geologist made important investigations in the Shaksgam valley. The naturalist collected insects, including spiders, at Moni Brangsa, beyond the Muztagh pass, on the Baltoro glacier and in the Biaho.

The expedition returned to Srinagar by the Deosai route and sailed from Bombay for Italy early in October.

THE NETHERLANDS KARAKORAM EXPEDITION, 1929-30.

MR. AND MRS. VISSER are now engaged on their third expedition to the Karakoram. Besides the leader and his wife, the party consisted at the start of Dr. Rudolf Wyss, Khan Sahib Mian Afraz Gul Khan, the well-known Survey of India explorer, and the guide Franz Lochmatter. The objects of the enterprise were mainly topographical, but Mr. Visser has already added so much to our knowledge of the Karakoram glaciers, that he will undoubtedly have collected much additional data on this subject. Mrs. Visser undertook the botanical department, and Dr. Wyss the geology of the districts visited.

The expedition left Srinagar on 30th April and reached Leh on 18th May. After a good deal of obstruction at that place, which is becoming normal when it is desired to make an early start over the Khardung pass, a base was established at Panamik in the Nubra valley on the 9th June. From here the party reached the snout of the Siachen glacier, and after ascending it for some five miles, discovered, explored and mapped the extensive glacier system, tributary to the left bank of the Siachen. Existing maps showed a tiny little glacier only four miles long draining into the Siachen; while two large transverse glaciers with numerous branches were shown descending from the Nubra-Shyok watershed and draining directly into the Nubra below the Siachen snout. It was known however that these glaciers were entirely imaginary, and the latest Survey of India map had wisely shown the region as "Unexplored." Both Dr. Longstaff and Major Gompertz had pointed out the probable lie of these glaciers, but it remained for the Vissers to discover them.

Five miles from the snout of the Siachen a fair-sized valley enters on the left bank, but owing to a bend in it no glacier can be seen until the valley has been ascended for two miles. The actual snout of the tributary glacier is about five miles from the Siachen. Four miles

up the glacier it bends sharply to the north and extends for some twelve miles to the watershed west of the southern branch of the Rimo glacier. The total length of this glacier is about sixteen miles, but it has a long tributary glacier, joining it about a mile north of its northerly bend, which descends from a great névé basin at the head of the Chong Kumdan glacier, near peak 22,980. The length of this eastern branch is about twelve miles. There is a third long glacier, lying in a trough running in a south-easterly direction to the watershed at the western head of the Mamostong glacier, but this, which has a length of thirteen miles, is separated from the main glacier tributary by a distance of about three-quarters of a mile. It seems probable that both this space and that between the main tributary and the Siachen may be filled at times by glacial lakes, which periodically burst their ice-dams and cause minor floods in the Nubra. Evidence of one such flood, in 1914, is given by Mr. J. P. Gunn in his report to the Punjab Government on the Shyok Flood of 1929.

On completing the exploration of these glaciers, which were carefully surveyed by Khan Sahib Afraz Gul on the half-inch scale, Mr. Visser turned his attention to the lesser side-valleys of the Nubra. These were mapped, including the considerable and somewhat complicated Cham-shen Lungpa, which enters the Nubra about eight miles below Panamik. The Saser pass was crossed on the 26th July, and two large tributaries, the Cham-shen *Jilga* and the Tughmo Zarpo Lungpa, both entering the right bank of the Shyok below Saser Brangsa and each containing large glaciers, were surveyed. The expedition left Saser Brangsa for Daulat-Beg-öldi near the Karakoram pass on 8th August, and were camped there at 5 A.M. on the 15th when they heard the bursting of the Chong Kumdan dam nineteen miles away, "with reports like cannon-shots." Mrs. Visser writes in a letter that a week earlier they would have been caught, as they were marching in the river-bed for several hours. From Daulat-Beg-öldi the Vissers travelled up the Chip-chap and explored its source, then turning northwards to the Kara-tagh region and the "Kushku-maidan." In this area some 1300 square miles of desolate country were surveyed by the Khan Sahib, the whole party suffering much from continual storm and bad weather.

In September the expedition crossed the undetermined frontier at the Kawak pass, leading to the Kara-tash, at which point the Khan Sahib was obliged to return under the orders of the Government of India, having surveyed altogether the amazing area of approximately 2300 square miles of practically unexplored country in 82 working

days. He reached Daulat-Beg-öldi on the 25th September, Leh on the 9th October and Rawalpindi on the 9th November.

The last letter received from Mrs. Visser was dated Suget, 23rd September. In this she alluded to the desperate inhospitality of the arid "Kushku-maidan," which they had just left, and to the admirable way the Ladakhi porters had behaved throughout. The party was resting at Suget for a few days "under the protection of the Amban," and awaiting transport to take them to Yarkand.

The expedition has our warmest congratulations on the successful completion of the first part of their programme. It is hoped to publish a full account in the next volume of this Journal.

THE CHONG KUMDAN DAM, 1929.

IN another part of this volume is given a brief account by MR. J. P. GUNN of his observations at the Chong Kumdan Dam. He was accompanied on his journey by MR. F. LUDLOW, who contributed an interesting article on the dam in 1928 in Vol. I. After the dam had burst Gunn returned to India, while Ludlow went on to Kashgar, where he spent Christmas. He expects to travel in the Tien Shan during the spring, where he intends to collect birds, butterflies and flowers.

A SHOOTING EXPEDITION IN LAHUL, 1929.

DURING the months from August to October 1929, CAPTAIN D. G. LOWNDES, 2nd Bn. the Royal Garhwal Rifles, visited northern Lahul (*Map*, 52 H). Crossing the Rohtang pass, 13,050 feet, in pouring rain on 31st July, Kyelang was reached on 3rd August, and Patsio on the 6th. The annual fair at this place was unfortunately over. The Bara-lacha La, 16,047 feet, was crossed on the 8th. The Yunan Tso contained very little water and one arm was crossed by wading in order to avoid a long detour. The next month was spent looking for game. Camps were pitched at various points on the road across the Lingti plain, and in the Sarchu and Tsarap Nalas, but game was scarce, particularly ibex, and only two burrhel (*Ovis nahura*) were shot. Large numbers of Himalayan snow-cock (*Tetraogallus Himalayensis*) were seen and a few teal were shot on the Yunan river. It was found impossible to get more than a few miles up the Tsarap Nala with the transport available—ponies from Kulu—as the track marked on the map was hardly existant.* This track is, however, regularly used by shepherds who visit the Patsio fair.

* The track is, however, only shown as a footpath.

On recrossing the Bara-lacha La on 12th September, the level of the water in the Suruj Dul was found to have dropped some thirty feet. On the return journey the Chokang Nala on the border of Chamba was visited.

The weather was, on the whole, fine, though there were frequent snow-storms between the 24th August and 12th September, and on the 8th October there was a heavy snow-storm which lasted for thirty-six hours, while snow fell again on the night of the 7/8th at Koksar. The Rohtang pass was recrossed on the 8th, there being about three feet of snow on the summit. The road throughout was good and easily passable for ponies, except on entering the Chokang Nala, where one pony was lost. The only streams, the crossing of which gave any difficulty, were the Yunan at Sarchu, which was only fordable in the morning, and the Sarchu stream, which was sometimes as much as waist-deep.

The portion of the Survey of India map, 52 H, on the scale of 4 miles to an inch, which covers Lahul, is from surveys made between 1849 and 1863 and is naturally full of minor inaccuracies.

The track along the left bank of the Yunan from Kilung and up the Lingti Chu should be marked as a footpath, though it is just passable for ponies. A mule-path now leads over the lower of the two bridges over the Tsarap Chu ; the upper bridge no longer exists. The village marked as " Sir Bhum Chun " is also non-existent. Both branches of the nala joining the Bhaga river on the right bank opposite Zingzingbar serai are now blocked by a glacier several miles in extent.

SIMLA TO LEH, 1929.

THE journey from Simla to Leh is frequently undertaken by members of the Himalayan Club and others. Yet in compiling Route 55 of *Routes in the Western Himalaya*, recent information could not be obtained. In the summer of 1929 LIEUT. I. M. CADELL accomplished the journey and has placed his notes at the disposal of the Club. The journey, which was hurriedly undertaken, with no time to make proper preparations, commenced from Simla on 10th June ; Leh was reached on 8th July. Halts of a day were made at Sultanpur (Kulu), Kailang (Lahul), and Sarchu (Lingti). The 380 miles, or 34 stages, were therefore completed in 24 marches.

The following points may be noticed : Mules or ponies can be taken the whole way, but they can only be hired at Simla, Fagu, Theog, Kulu and Kailang. Simla mules are not good and the rates



APPROACH TO BARALACHA LA, 16047 FEET, LAHUL.

Photo. I. M. Cadell.

are high. Coolies are difficult to obtain in Kulu. Animals from Ladakh or Lahul are recommended. Tinned stores can be obtained at Sultanpur, and in limited quantities at Kailang and Leh. *Ata*, milk, etc., can be obtained throughout in limited quantity, except between Patsio and Gya.

A permit is required to cross the "inner line" at the Bara-lacha La. This should be obtained from the District Commissioner of Kangra. The Punjab Government has published a small pamphlet on Kulu, which may be obtained from the same source; this gives current rates.

Further details may be obtained from the Honorary Librarian or local Editor at Simla.

A LITTLE-KNOWN ROUTE IN SIKKIM.

ON THEIR RETURN from the Zemu glacier, after leaving the German Kangchenjunga expedition in the autumn of 1929, first LIEUT.-COL. TOBIN and later MR. E. O. SHEBBEARE explored the little-known route over what is wrongly shown on the map as the Yumtso La (= Blue Water Pass) to the Tulung monastery, the Talung gorge and the Tista.*

At Yakthang (or Dzakthang=swampy ground), a track from Lhonak via the The La descends to the Zemu, which is here spanned by a fair cantilever bridge. The track rises from the south bank, in some 5000 feet, to the Keshung La, seven miles from Yakthang. The last few hundred feet are in snow throughout the year, but there is no difficulty. The true Yumtso La is said to be about three miles further west and was used, prior to the construction of the Yakthang bridge in about 1905, to communicate between the Talung and the Zemu, and with Lhonak, via the Tangchung La.

From the Keshung La the route descends to Solang—a yak-grazing station, and not a lake, as shown on the map (Solang=bullock)—and thence follows the right bank of the Ringbi or Rindiang Chu to a Lepcha hamlet named Piago. Close to Piago, the fall of the Ringbi over a sheer cliff of six hundred feet creates the beautiful Tidzong Babsar (waterfall). Just west of this fall a path zigzags down the cliff face and descends to the forest and the gorge. It crosses the Ringbi twice, by cantilever bridges, to avoid the Tulung Chu, which rushes down from Siniolchu to join the Ringbi Chu a short distance above the Tulung monastery.

* See Sketch Map of Sikkim at the end of this volume.

The abbot of this ancient monastery, Tulung Chu Tunbo, is a delightful, hospitable and energetic old gentleman who insists on escorting his rare visitors from end to end of his "diocese." From Tulung monastery the track descends to Be, where it crosses to the left bank of the Ringbi Chu, and follows this to its junction with the Talung Chu. A track well above the latter leads to the precarious cane bridge at Lingsha Sanpo, and after crossing the torrent by this leads the traveller to Lingtam monastery after about a four-hours' scramble.

About two hours down from Lingtam the Tista is crossed by a sound suspension bridge and in another hour Mangen, on the main road to Lachen, is reached.

Though yaks traverse much of this route, it is quite impassable for pack-ponies. But by riding from or to Mangen and travelling fairly light, it is not difficult to get from the snout of the Zemu glacier to Gangtok in five days.

Colonel Tobin's itinerary was as follows :

1. *Left* Yakthang, 6 A.M. ; *arr.* Keshung La, noon ; Piago, 3 P.M.
2. *Left* Piago, 6-30 A.M. ; *arr.* Tulung monastery, 11 A.M.
3. *Left* Tulung mon., 7-30 A.M. ; *arr.* Be, 10-30 A.M.
4. *Left* Be, 6 A.M. ; *arr.* Lingtam monastery 2-30 P.M.
5. *Left* Lingtam mon., 5-30 A.M. ; *arr.* Mangen 9 A.M. ; Dikchu, noon ; and Gangtok, 4-30 P.M.

THE ROOSEVELTS' EXPEDITION TO SZECHUAN, 1929.

THE Roosevelts' book *Trailing the Giant Panda*, giving details of their expedition to Szechuan, has already been published and is reviewed on another page of this *Journal* (page 167). It is not necessary, therefore, to make more than a passing reference here, and to congratulate them on the successful results of their enterprise.

KINGDON WARD'S JOURNEY FROM BURMA TO ANNAM.

IN December 1928 Theodore and Kermit Roosevelt, with Suydam Cutting and H. Stevens left for Yunnan and Szechuan on the journey described in their book *Trailing the Giant Panda*.* It was their intention to be back in southern Yunnan about April, and march southwards into French Indo-China, by way of the Mekong valley. Kingdon Ward, starting from Mandalay, was to work

* See Review on page 167.

eastwards, cross their track, and join them somewhere in the French protectorate of Laos about May. From here the party would proceed together through French Indo-China towards the coast of Annam.

Leaving Rangoon early in March, Kingdon Ward travelled to the Salween via Thazi and Taunggyi; there is a dry-weather motor road the whole way. Thence Keng-tung, four hundred miles from Mandalay, was reached in three days, by a good mule-road. The direct route from Keng-tung to the Mekong takes about ten days. Kingdon Ward chose a more circuitous one in order to climb the highest hill in the Southern Shan States, a peak not much over 8000 feet. Using Kaw guides, he ascended this hill in April, collecting a number of interesting orchids and other plants. Near the summit he found a fine white-flowered epiphytic rhododendron in full bloom, and two other species—one almost certainly new—out of bloom.

On 1st May he crossed the Mekong into French territory, passing through some fine forest, where several beautiful orchids were met with. Muongsing, the first French outpost, was reached two days later. It was here that he was laid low with fever and held up for five weeks, during which time he heard that the Roosevelts had reached Yunnan-fu and had proceeded straight to Saigon by sea, finding it impossible to get through overland during the rainy season.

Early in June Kingdon Ward crossed the mountains to the east of Muongsing and reached the Namtha river. The rains had now set in properly, and he too discovered that travel in Laos, except by boat, was impossible. Embarking in a canoe, he travelled down the Namtha river for five days, through an almost continuous series of rapids. The scenery was beautiful, and many of the forest trees and giant climbers were in flower. A certain amount of botanical collecting was done during the voyage. The Namtha river flows into the Mekong. Arrived at the confluence, Kingdon Ward transferred to a raft and five days later reached Luang-Prabang. From the ancient capital of Laos to Vientiane, the modern capital, is 290 miles, the river being impeded by rocks and rapids the whole way. The post-raft was taken, and the journey completed in nine days. Under the circumstances very little botanical collecting was possible.

Kingdon Ward was not yet finished with the Mekong. In the dry weather there are alternative routes overland, southwards to Siam or eastwards to the coast of Annam; but in the summer the

traveller must keep to the river. The remaining 250 miles to Savanakheth, however, was covered more rapidly, as this stretch of the Mekong is navigable for shallow-draught steamers, and the Résident Supérieur kindly placed his private launch at Kingdon Ward's disposal. By this time he had travelled about seven hundred miles on the Mekong and two hundred on the Namtha river—a restful way of progress, but monotonous, and as he says, not very helpful to the botanist or collector, unless, indeed, he had been going *upstream*. Nevertheless some interesting plants were collected and notes made of those seen in flower; a small but valuable collection of insects, chiefly beetles and grasshoppers, was also obtained in this entomologist's paradise of the Mekong.

From Savanakheth there is a motor-road—all-weather—eastwards to the coast, about two hundred miles distant. Descending the seaward side of the Annamite chain, the railway, seventy miles from Hué, the capital of Annam, is soon reached. Kingdon Ward did the journey to Hué by lorry in two days, where he took the train to the seaport of Tourane. Two days later he was in Saigon, where he met Theodore Roosevelt, who had been shooting big game in Cochin China for a month. His brother had already returned to America, and Theodore left almost immediately, eastward bound, while Kingdon Ward continued the voyage to Singapore and thence to Rangoon.

THE ABOVE BRIEF descriptions of expeditions have been compiled mainly from letters, articles and information derived from various members who took part in them. The leader of every expedition described is a member of the Himalayan Club.

The following two expeditions contained no members of the Club but it is thought that details will be of interest to our readers. One, the Russo-German Alai-Pamir expedition of 1928 contained 40 European members, was most carefully organized, and carried out scientific investigations with the utmost thoroughness; the other, in which a single white man without experience took part, attained nothing and ended in disaster. The account of this last has been drawn up by Lieut.-Colonel H. W. Tobin, Honorary Local Secretary of the Club at Darjeeling.

THE RUSSO-GERMAN ALAI-PAMIR EXPEDITION, 1928.

DURING the past year the preliminary account, in German, of this expedition, which was jointly organized by the Soviet Academy of Sciences and the German Society for Scientific Research, has

appeared in Volume 10 of the *Deutsche Forschung*, the periodical of the latter society.*

The expedition was the most carefully prepared and most scientifically equipped that has ever explored the Pamirs. It was divided into two sections, German and Russian, which, though working in co-operation, actually divided up the various subjects to be investigated so as to avoid formalities and difficulties in dealing with the results. For this reason the duties were generally distributed as follows: the Germans were responsible for the photogrammetry and topography, the geology, glacier exploration and philology in the mountain valleys; the Soviet section undertook the meteorology, mineralogy, petrology, geodesy, astronomy, zoology and botany. Could any scheme of exploration be more comprehensive ?†

The German section left Berlin on 10th May, 1928, and Osh on the 19th June. From Osh the main road took them over the Taldik

* I am indebted to Lieut.-Cols. C. M. Thompson and W. H. Hamilton for translations of the most important parts of the various accounts that have appeared. Besides the full account in the *Deutsche Forschung*, brief summaries have appeared in *Petermann's Mitteilungen*, *Zeitschrift der Gesellschaft für Erdkunde zu Berlin*, and *Zeitschrift des Deutschen und Österreichischen Alpenvereins*. Papers in English have appeared in both the *Alpine Journals* of the year, and in the *Geographical Journal*, Vol. 74. A book in German, which we have not yet seen, entitled, *Alai ! Alai ! Arbeiten und Eerlebnisse der Deutsch-Russischen Alai-Pamir-Expedition* has also appeared.

† *German section*: W. R. Rickmers (leader and organizer); Dr. Richard Finsterwalder (stereo-photogrammetry, Munich); his assistant, Dr. Biersack (Munich); Dr. W. Lentz (philology, Berlin); Dr. L. Nöth (geology, Hamburg); Dr. W. Reinig (zoology, Berlin); and five climbers, Dr. P. Borchers (Bremen), Dr. (of medicine) E. Allwein (Munich), Dr. K. Wien (Munich), Eng. E. Schneider (Berlin), Dr. (of medicine) F. Kohlhaupt (Sonthofen). Total 11.

Russian section: Professor D. I. Schtscherbakoff (leader and mineralogist); L. A. Perlin and the brothers Judin (assistants in organization); Prof. L. N. Korschenewsky (geography); Prof. J. J. Belajeff (astronomical latitudes and longitudes); J. G. Dorofejeff (topography); R. R. Zimmermann (meteorology and anemometry); four student assistants from the Central Asian University, viz. Gurjeff, Sagrubsky, Posdejeff, and Snamensky; W. M. Tabusky and S. A. Brimann (radiology); Isakoff (geodesy); A. N. Reichardt and G. N. Sokoloff (zoology); W. N. Michalkoff (magnetism); Labunzoff (mineralogy); Scherdenko and Andrejeff (interpreters); Dr. Otto Schmidt, N. W. Krylenko, his wife, E. F. Rosmirowitsch, Dr. (of medicine) E. M. Rossel (mountaineers); Schneiderow and Toltschan (cinematography). Total 28.

P. N. Gorbunoff, Chief of the Executive Committee of the Council of Commissaries of the People, appears to have undertaken the direction of the combined enterprise.

pass to the Alai valley and the Great Kara-kul.* Here Reinig, the zoologist, branched off for his journey over the Pamirs; the mountaineers and topographers halted for a fortnight to explore the south side of the Trans-Alai range, including the Kara-jilga valleys; and Rickmers pushed on with the main body over the Kizil-belis, and across Kok-jar into the Tanimas valley, where he erected the depot ("Dust camp") beyond the great glacier which they discovered and christened the Notgemeinschaft (or "Society's") glacier. Previous maps had shown the head of the Tanimas valley filled by a large glacier descending from a somewhat mythical pass, the Tanimas Dawan, leading directly to the Wanj valley. Into this large glacier were shown several long branches entering from the north. Nothing could have been further from the truth. Kohlhaupt and Perlin pushed up the Tanimas, reached the pass at its head, scarcely treading on ice to do so, and gazed for the first time on the head basin of the northern-flowing Fedchenko glacier, which has since proved to be the longest glacier outside sub-Polar regions.

From this depot camp the various members of the expedition now separated to accomplish their tasks, according to the pre-arranged plan. Lentz, the philologist, devoted himself to the upper Bartang, whence, later, he made his way out through the western valleys with Kohlhaupt to the railway. Gorbunoff, with Russian guides, crossed from the Bartang to the Yazgulum by a previously untraversed pass, and ascending the unknown Yazgulum glacier passed over the névé at its head to find himself at the extreme southerly source of the Fedchenko glacier. Meanwhile the various German topographers and geologists were exploring the whole basin of the Fedchenko and Notgemeinschaft glaciers, both of which were traversed throughout their whole length. Both rise from the group of mountains at the southern end of the Seltau chain, the highest peak of which was named "Dreisnitz"; its height was determined accurately as 6950 metres. A slightly lower summit (the "Breithorn"), 6850 m. was climbed.

On 8th September Rickmers quitted "Dust Camp" depot, and travelling over Kok-jar and the Takhta-koram pass to Altin-Mazar, met the Russian and German climbers, who had followed the Fedchenko glacier from its source to its snout. From here Allwein, Wien and Schneider succeeded in reaching the head of the Sauk-Dara

* Most of the area explored falls in Survey of India Maps 42 A, B, E, F, which give a rough idea of the route as far as the Depot.

and, on the 25th September, climbed to the summit of Peak Kaufmann.* The height of this peak, 7127 metres, determined in 1913, by the Russian Military Triangulation (during the Indo-Russian triangulation connection ?), was confirmed by stereo-photogrammetry. The Russians departed from Altin-Mazar on 18th September, while the Germans broke up at Daraut Kurghan on the 17th October and rode over the Tunguz-bai pass to Osh.

It is not possible to give more than this brief outline of the expedition, details of which must be sought in the published accounts. But it may not be out of place to mention a few of the outstanding results achieved. Of the greatest interest to us is the actual topographical discovery of the great length of the Fedchenko glacier. In the early reports of the expedition this glacier was credited with a length of about 44 miles. On plotting the photographic survey from the amazingly fine photographs taken by Richard Finsterwalder, it has since been found that this glacier, which was in the old maps shown with the insignificant length of about 14 miles, has actually a total maximum length of 77 kilometres (roughly 48 miles), measured along the longest stream-line. The glacier, with its whole basin and all its branches, has been plotted automatically on the scale of 1 : 25,000. The total area covered by it and all its branches amounts to 1350 square kilometres. The Fedchenko glacier is thus the longest glacier outside sub-Polar regions, though its area is somewhat less than that of the Siachen, 1553 square kilometres.

Another discovery of much interest, also due to the accuracy determinable by stereo-photographic methods, is the great height of Peak Garmo. On our Survey of India maps, this peak is shown at lat. $38^{\circ}55'$, long. $72^{\circ}12'$ and is given no height. The highest mountain in Russian territory was believed to be Peak Kaufmann, 7127 metres, the peak climbed by members of the expedition. The highest in the Seltau was believed to be Dreispitz, 6950 metres. Peak Garmo, is now found to be at lat. $38^{\circ}58'$ and long. $72^{\circ}01'$, at the east end of the Peter the Great range, and has a height of 7495 metres. The 1913 expedition of the German Alpine Club, under Rickmers, approached within 12 miles of Peak Garmo from the west, but owing to bad weather was unable to identify it, and considered a peak lying to the south the highest in the region. Accurate determinations have

* See note on the name of this peak on page 136.

now been made by stereo-photogrammetry, which settles these questions beyond doubt.*

Peak Garmo does not belong to the actual Pamirs, but lies in the wild and bleak north-west outer ring of them, and so forms a western counterpart to Kungur and Muztagh Ata. The following statement gives the comparisons of the heights of peaks so far known on and in the neighbourhood of the Pamirs.

Kungur II, Kashgar range, 25,200 feet (exact height doubtful).

Kungur I, do. do. 25,146 feet.

Garmo, Peter the Great range, 24,590 feet.

Muztagh Ata, Sarikol range, 24,388 feet.

Kaufmann, Trans-Alai range, 23,382 feet.

Dreisnitz, Seltau range, 22,802 feet.

South Garmo, Peter the Great range, 22,540 feet.

"Breithorn," Seltau range, 22,474 feet.

THE TRAGEDY ON KANGCHENJUNGA, 1929.

EDGAR FRANCIS FARMER, of the Standard Oil Company of New York, lost his life on or about 27th May 1929 in a plucky but misguided attempt to reach the summit of Kangchenjunga, *alone*.

Though Farmer had had no experience of climbing elsewhere than in the Rockies, his books and notes show that he had studied his subject thoroughly. He did not divulge his intention to officials or others in Darjeeling, competent to advise or dissuade him, but having obtained the Sikkim frontier pass, after signing the usual undertaking that he would not enter Tibet or Nepal, he started on 6th May, ostensibly to explore the Guicha La region. His ambitious resolve was only disclosed on the return of his porters without him and on examination of his papers after his death. His sole companions were Sherpa and Bhutia porters—all reliable men—whose story is as follows.

Having visited the Guicha La, Farmer turned west, and, after crossing the Kang La into Nepal, he carefully avoided Tseram and ascended the Yalung glacier to a point immediately below the south-west cliffs of Kangchenjunga. His camp-site here is identical with that of Raeburn and Crawford in 1920, and his party found graves which can only have been those of the victims of the disaster to Guillardmod's expedition of 1908.

* At the time the preliminary account was published in the *Deutsche Forschung*, neither the great length of the Fedchenko glacier nor the true height of peak Garmo had been accurately determined. The preliminary map shown therein is therefore only approximate. A corrected map appears in the *Zeitschrift des Deutschen und Österreichischen Alpenvereins*, 1929.

On 26th May, with three ex-Everest porters, he started up an ice-fall below the Talung saddle, the south-west cliffs of Kangchenjunga being on his left. Though Farmer himself was extra warmly clad and well-equipped with crampons, his men were indifferently shod and had no crampons. The sun grew powerful, and when his *Sirdar* pointed out the danger of proceeding thus equipped, he promised to turn back by noon. The going became worse, and a porter slipped and was unable to proceed. At this juncture Farmer ordered the remainder to halt while he continued a little higher in order to take photographs, after promising to return shortly. All efforts to dissuade him failed ; he went on and on, into the mist, the porters waving to him to descend, at intervals when the mist cleared. He was still climbing at five o'clock, after which the mist seems to have obscured him. The porters remained on the look-out till dusk, when they descended to camp and prepared food for him. From here they signalled at intervals with electric torch and Meta fuel. On the following morning they climbed to a spot whence his route could be clearly seen, and as the sun topped the Talung ridge they caught a glimpse of him far above them on a steep snow-slope ; but he soon disappeared—to be seen no more. Vision plays strange tricks under such circumstances, and it is of course possible that the porters were mistaken. But they assert it positively, and describe him as moving wildly with arms outstretched. This gives rise to the theory that he had been smitten with snow-blindness. Their vigil continued throughout the whole day and until nine o'clock on the morning of the 28th, when intense hunger forced them down. Reaching Tseram on the 30th they exchanged a *chuba*, or Tibetan coat, for some Indian corn, and sent their strongest man straight in to Darjeeling, where he arrived on 6th June with news of the tragedy.

The men's narratives were taken down separately and checked by knowledge of the locality, by dates and by distances. Those who investigated the evidence are convinced that the whole truth was told and that the conduct of the porters was unexceptionable. Farmer had previously, near the Guicha La, created alarm by disappearing alone for several hours. He had the ideal build for a climber and possessed courage and determination, but without doubt the obsession of his ambition affected his judgment and brought about his tragic end. The greatest sympathy is felt with his mother, whose only son he was.

IN MEMORIAM.

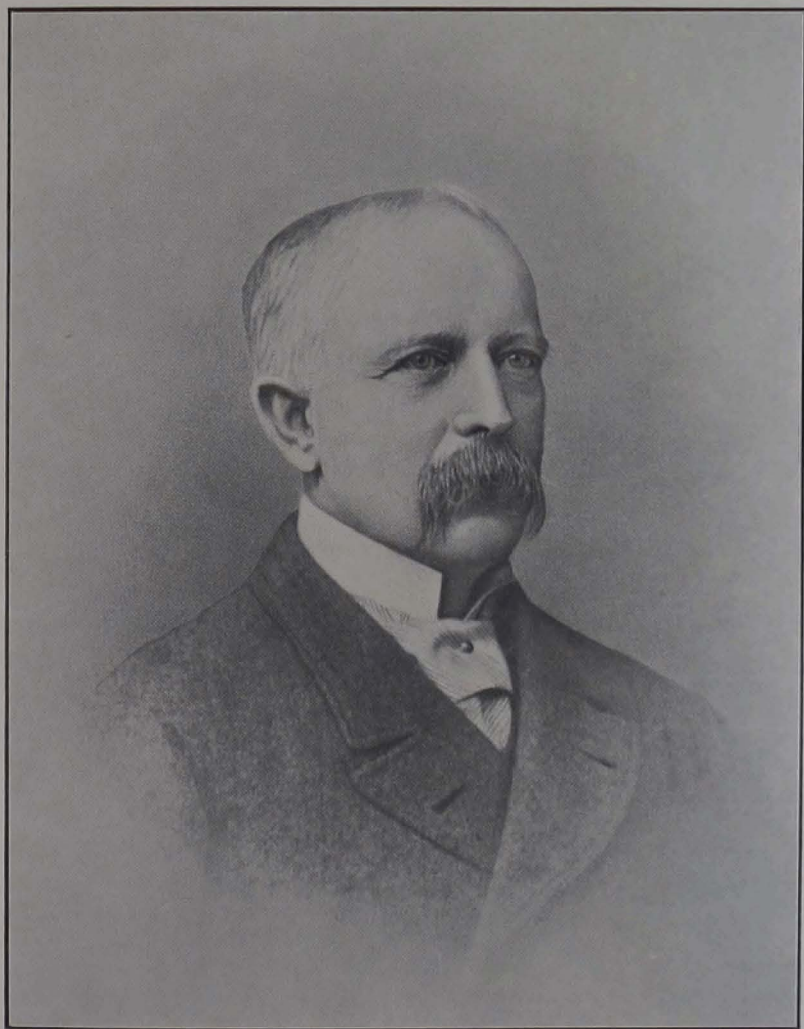
COLONEL SIR THOMAS HUNGERFORD HOLDICH,
K.C.M.G., K.C.I.E., C.B.

(1843—1929.)

SIR THOMAS HOLDICH, who died on 2nd November 1929, at the age of 86, was one of our greatest authorities on the North-West Frontier of India, having spent twenty strenuous years from 1878 to 1898 on surveys connected with military expeditions, and on boundary commissions, on every part of the borderland from Makran to the Pamirs.

Holdich probably had the most distinguished public career of any officer of the Survey of India, though his work fell in an entirely different sphere to that of the many well-known geodesists of the department. He was essentially an outdoor man, small and spare of body, and of great energy; he was a very able topographical surveyor, had the greatest judgment and tact in dealing with frontiersmen, and was a "thruster" all the time. He was a marked man after his brilliant work as a survey officer during the Second Afghan War, and was called from one important task to another, until he had accumulated an extensive experience of military and political adventures, and a profound knowledge of the geography and peoples of the North-West Frontier of India. When he left India he was the supreme authority on all matters connected with boundary delimitation and demarcation, and he was shortly afterwards selected for the charge of the very important Chile-Argentine Boundary Commission.

Born in 1843, Holdich was commissioned in the Royal Engineers on 17th December 1862, came out to India early in 1865, and was posted to the Survey of India almost at once. He got his first opportunity of active service with the Bhutan Field Force as assistant surveyor, during the cold weather of 1865-66, and was soon on service again, for after about a year in Rajputana, he was selected in December 1867 as one of the survey officers with the Abyssinian campaign. Sir Robert Napier's force was sent into this little-known country to rescue the Europeans imprisoned by King Theodore and the campaign culminated successfully in his capture of Magdala. In 1869 Holdich returned to India and joined a survey party in Central India, and was employed on the normal duties of the department till he took furlough in 1877. From this furlough he was recalled to join the Southern



THOMAS HUNGERFORD HOLDICH.
1843-1929.

Afghan Field Force in December 1878, and thus began his twenty years' work on the frontier.

When the second Afghan war broke out, our geographical knowledge of tribal country was appallingly scanty, and our columns marched out with the vaguest ideas of what was before them. The maps showed nothing but the general line of a few main routes, and the war gave our surveyors their first opportunity of mapping the country. Officers from the Survey of India were posted to every column, and carried proper surveys, based on triangulation, from India into the heart of Afghanistan. Much of their work remains to this day.

Holdich was one of several Survey of India officers attached to the Kandahar column, which suffered terrible hardships marching up the Bolan pass, losing thousands of camels on the way. An accurate chain of triangles was carried up to Kandahar by Maxwell Campbell, Heaviside and Rogers; Holdich himself had charge of the surveyors who followed close behind, and mapped the country up to Kandahar and beyond.

At the conclusion of peace, in the spring of 1879, Holdich accompanied General Biddulph's column which returned to India through totally unexplored country, marching from Pishin eastwards, through the Bori valley, where Loralai now stands, over the Sulaiman range and out into the Dera Ghazi plain past Fort Munro.

The peace was of short duration; the fate of Cavagnari's mission at Kabul restarted the war in the autumn and Holdich joined the Khyber force. The survey officers who had accompanied the Kurram and Khyber columns during the first phase of the war were nearly all out of action. Samuells and Charles Strahan were down with typhoid; Edward Leach, who had won the V. C., Tanner and Woodthorpe had all been wounded. G. B. Scott alone, who had combined some remarkable fighting with the first survey of the Kabul river gorges, was left whole. Woodthorpe, however, was able to join the Kurram column under Roberts, while Holdich, with Bright's force, carried triangulation up the Khyber, and the two made their first junction on the hills overlooking Bala Hissar. Surveys and rapid reconnaissances were now pushed out in all directions from Kabul, Holdich himself working northwards to the Paghman range. Work was interrupted by the siege of Sherpur, in the defence of which Holdich and his surveyors took an active part. Subsequently he accompanied Roberts on the famous march to Kandahar, but, as might be expected, the pace was too hot for much survey work. For his

services during the two Afghan campaigns, Holdich was mentioned in despatches, and promoted brevet-major in 1881.

Just as in 1919, war with Afghanistan was immediately followed by trouble in Waziristan, and early in 1881 a force was organized at Dera Ismail Khan to deal with Mahsuds who had been raiding Tank. Holdich went as survey officer with the northern column, and in the course of his work climbed with his escort to the top of Shuidar, whilst Gerald Martin, attached to the southern column, climbed Pre-Ghal, the higher of these two peaks, which are such prominent landmarks from Razmak.

This was probably the first occasion on which either peak had been climbed by a European, although a claim to be the first up Pre-Ghal was made as recently as 1927. The Survey of India cannot publish accounts of all the climbs carried out by its officers in the course of their work, and is particularly reticent about any work carried out on the frontier. In this instance Holdich has himself told the story of these particular climbs in his book, *The Indian Borderland*.

After a short period in charge of survey at Kohat, Holdich was, in 1883, placed in charge of the Baluchistan survey party, and he held this charge, on paper, till his retirement.

An opportunity for further exploration came at once in the wild country of north-east Baluchistan. The Shiranis had been blockaded without effect for some two years, and it was decided to send a small "survey promenade" into the heart of their country. The only opposition came from the Khidarzai clan in the neighbourhood of the Takht-i-Sulaiman. The Takht is a mighty mountain 11,300 feet high, north-west of Dera Ghazi Khan. Its slopes are a series of horrible precipices, and its approaches lie through tortuous defiles, a most formidable citadel to carry against determined opposition. The actual capture of the enemy position was due to Holdich, who, whilst out planetabling, discovered an unguarded but difficult route to the summit. Guided by Holdich in the night, a column turned the Khidarzai position and captured it without a single casualty; Colonel Maclean won the subsequent race to the summit, Holdich having to content himself with arriving third. From this glorious viewpoint he sketched a large extent of new country, and cut in many valuable points by theodolite.

The steady advance of Russia's influence into Turkistan was causing great uneasiness in England as well as India, and in 1884 the Russo-Afghan Boundary Commission was appointed to settle the

southern limits of the Russian Empire along the Afghan border. Holdich was posted as chief survey officer of the Indian section, and he travelled up through Afghanistan from Quetta, by way of Kandahar, the Helmand and Herat. The old boundary between Turkistan and Afghanistan was extremely vague, and though the Russians had done a good deal of reconnaissance, our maps of the country were a complete blank.

The Commission spent long weary months over protracted negotiations, and there was very nearly a split between Britain and Russia over the famous Pandjeh incident; it was not until a very strong line was taken by the British Government that a peaceful solution was found to a situation fraught with danger. The survey work accomplished by Holdich and his small party was astounding, both as to its rapidity and accuracy. Triangulation was taken from the neighbourhood of Kandahar, through western Afghanistan to the Hindu Kush near Herat, and thence from Sarrahs eastward along the frontier, back over the Hindu Kush and connected to old work near Kabul. On this triangulation was based all the British and Russian surveys carried out for the Commission, and British and Russian surveyors had the greatest respect for each other even when the relations between the political camps were strained.

The chart of this triangulation is still reproduced in textbooks as an illustration of how such work may be carried out. For his services on this Commission Holdich was promoted brevet-lieutenant-colonel in 1887, and awarded the gold medal of the Royal Geographical Society.

For the next few years Holdich was fully occupied with surveys in Baluchistan at the time that Sir Robert Sandeman was establishing the "Pax Britannica" by his unobtrusive methods. At the end of 1889 he accompanied Sandeman on the "political promenade," known as the Zhob-Gomal expedition, during which the whole of the Zhob valley and much of the Kunder were surveyed, and the site of Fort Sandeman was selected.

Holdich was promoted brevet-colonel in 1891; he became Superintendent of Frontier Surveys in 1892, and was awarded both the C. B. and the C. I. E. early in 1894.

Holdich was now called on to take a prominent part in the settlement of the Durand Line, along the boundary between Afghanistan and India, of which the general terms were agreed to at Kabul between the Amir Abdur Rahman, and Sir Mortimer Durand. Holdich would very much have liked to have had a say in this agreement,

but he was only called in afterwards to organize the survey parties that were to delimit and demarcate the various sections of the boundary, whilst he himself accompanied Udny to fix the boundary on the northern section between Kafirstan and Chitral.

In December 1894 a small party including Holdich and Coldstream as survey officers, marched up the Khyber along the Kabul road, crossed the Kabul river at Jalalabad, and ascended the Kunar which is the river of Chitral. They passed Asmar, the headquarters of a large Afghan army, and reached Arnawai on the disputed border, where they were to have met Captain Gurdon, the representative of Chitral. But Gurdon never came, as he was held up at Chitral by the troubles instigated by the famous Omra Khan, and the Boundary Commission had to carry on without him, whilst the plucky little garrison at Chitral was enduring its historic siege only sixty miles away. Under the definite orders of the Government of India, Udny and Holdich continued the work of demarcation and survey, and the Afghans held aloof from the fight. The boundary was settled up to the Dorah pass by April 1895. The actual survey completed was disappointing for the Afghans refused to allow any work that was not absolutely necessary for the delimitation.

Hardly was Holdich back from this work than he found himself appointed, in June 1895, chief survey officer on the Pamir Boundary Commission with Wahab as his assistant.

This Commission was a sequel to the meeting of Younghusband and the Russian outpost in 1891, since when the Pamirs had been much in the public eye and had attracted the well-known visit of Lord Curzon in 1894. The Commission was to fix a line putting a limit on the Russian approach to India ; and in order to provide a buffer between British and Russian territories, the Amir was given the narrow strip of Wakhan, which is only eight miles wide at one point, and forms a belt of Afghan territory separating the Pamirs from Chitral ; it was the northern edge of this strip that was demarcated.

The Russian mission under General Shveikovsky met the British mission under General Gerard on the banks of Lake Victoria, and worked eastwards to the Chinese frontier without a hitch. The Great and the Little Pamirs were surveyed in detail, and a great addition was made to geographical knowledge. The Russians and British parted on the Pamirs on 12th September finishing up with a most cheerful night. Cossacks and Khirgiz, Kashmiris, English, one Frenchman, and Afghans all making merry together with dances, music and liquid refreshment.

On his return Holdich was immediately appointed Chief Commissioner of the Perso-Baluch Boundary Commission with Wahab as his chief survey officer to demarcate the frontier between Persia and Baluchistan. Holdich was now for the first time in charge himself; he already knew much of the ground; surveys under his own control had already been carried right up to the frontier and he knew how to deal with the Persians with whom he had to negotiate. With these advantages he was able to complete demarcation before the hot weather of 1896. He was rewarded by a K. C. I. E., granted in 1897.

The year 1897 saw the Frontier ablaze from Waziristan to Swat, and once more Holdich had to find officers and surveyors to accompany each column of soldiers into the heart of tribal territory. He took personal charge of the surveys in Tirah; but in 1898 before the campaign was closed he had to hand over to his old friend Colonel Wahab for no other reason than the arrival of the fifty-fifth anniversary of his birth. Thus he ended his Indian career whilst still in the full swing of work; and a very fine career it was. One might almost say that the days of such opportunities are past and gone for ever.

Sir Thomas Holdich was not the man to live a life of comfortable idleness just because the Government of India had no further use for him. He had a clear head and a ready pen and he has left us many instructive papers and interesting books; but soon after the publication of his first book *The Indian Borderland* he was called upon to direct the settlement of the Chile-Argentine Boundary dispute, and once more enjoyed an active life on the hills.

He went out to South America early in 1902, taking with him two officers of the Survey of India, Robertson and Crosthwait, and returned after eight months' work in the field. The difficulty of determining the true watershed had been very great, but the result was eminently successful. The award of King Edward VII was based on the report of the Commission and signed in November 1902 to the satisfaction of both disputants.

Sir Thomas published his experiences on this Commission in a book entitled *Countries of the King's Award*, and followed this with *India* (1904), *Tibet* (1906), *The Gates of India* (1909), and *Political Frontiers and Boundary Making* (1918).

He was a very keen councillor of the Royal Geographical Society for many years, and was President from 1916—18. He was a prolific writer for various geographical magazines, and contributed a large

number of articles on Indian and geographical subjects to the 11th edition of the *Encyclopædia Britannica*. He held and expressed freely very decided views on the policy followed in our dealings with Afghanistan and the frontier tribes, from the days he first started his career on the frontier till the most recent events connected with the fall of King Amanullah. He even wrote a letter to the *Times* explaining the origin of Queen Souriya's family.

He was keenly interested in the formation of the Himalayan Club, and as a founder member made most generous contributions to the foundation fund and library.

R. H. PHILLIMORE.

H. H. MAHARAJA SIR CHANDRA SHAMSHER JANG BAHADUR RANA,
G.C.B., G.C.S.I., G.C.M.G., G.C.V.O.

Prime Minister and Marshal of Nepal.

(1863—1929.)

SIR CHANDRA SHAMSHER died at his home in Kathmandu on the 25th of November last. His Highness was 66 years of age and had ruled over the kingdom of Nepal since the year 1901. It is perhaps too early yet fully to appreciate all the benefits accruing to Nepal by reason of Sir Chandra's foresight and energy, but it can be said without fear of contradiction that the late Maharaja was easily first amongst the many distinguished sons of Nepal. His conduct throughout the course of the Great War alone would entitle him to a high place in history : during those four eventful years the Maharaja placed the entire resources of his country at the disposal of the British cause. What this meant to the man-power of Nepal only those who have been privileged to serve in Gurkha regiments can fully appreciate. The late Maharaja was keenly interested in Himalayan travel and exploration. He had been for many years a Fellow of the Royal Geographical Society, and had lately been elected to the select body of Honorary Members. It is characteristic of his ever generous nature that whilst the policy of his Government was such that he was unable to permit the Everest Expeditions to enter his territory, he did not consider that this precluded him from subscribing handsomely to the funds which made them possible. One of his last public works was to cause a complete survey to be made of the whole area of Nepal, and this important work was completed in 1928.

Nepal is, to all intents and purposes, a country completely closed to strangers : but once the rare and much coveted invitation to visit

the country had been extended, Sir Chandra would spare no effort to further his guests' desires.

The Prime Minister, had he lived, would certainly have become a member of the Himalayan Club; he was keenly interested in many of the ideals for which the club stands and would, I know, have done all in his power to further our interests. Sir Chandra leaves a large family, but in accordance with Nepalese tradition he is succeeded by his brother, General Bhim Shamsher, who, it is gratifying to note, has already made known his intention not in any way to alter the wise and statesmanlike policy initiated by the late Maharaja.

C. J. MORRIS.

NOTES.

CALCUTTA AND DARJEELING NOTES. The spirited attack of the German expedition on Kangchenjunga is told elsewhere in this volume. Lack of opportunity rather than lack of enterprise accounts for the fact that the eastern members have not more to record, but there has been a steady increase in numbers and a growing atmosphere of enthusiasm.

A first step towards increasing opportunities of travel off the beaten track in Sikkim has been made by acquiring equipment, and it is now possible for members to obtain on loan tents, ropes, ice-axes, crampons, etc., at a very moderate charge.

A "Hut Fund" has been opened by allotting Rs. 500 from the capital available after amalgamation of the Mountain Club of India and the Himalayan Club, and it is hoped to increase this fund by various means. The location of the first hut has not yet been fixed. Huts are required at Dzongri, the Zemu glacier and the Dongkya La, all of which have equal claims. From this year's experience, the Zemu glacier appears to be the best base for attacking Kangchenjunga, while a hut at Dzongri would probably be more popular owing to its accessibility. Any donations to this fund will be gratefully acknowledged by the Local Honorary Secretary at Calcutta.*

* Donations should be sent to The Local Honorary Secretary, The Himalayan Club, c/o Parry's Engineering, 10, Clive Row, Calcutta.

Thanks to the generosity of Lt.-Colonel Derviche-Jones, who opened the fund with a generous donation, and to other members resident in or near Calcutta, a Zeiss Epidiascope has been purchased to enable members to illustrate their travels at evening lectures, which it is hoped will be arranged after informal Club dinners. Two such dinners have already been held during the past year, at the instigation of Sir Edwin Pascoe. Both were held at the United Service Club, and brief accounts will be found of them under "Proceedings" elsewhere in this volume.

G. B. G.

THE COUNCIL OF THE ROYAL GEOGRAPHICAL SOCIETY awarded the Back Grant for the year 1929 to Mr. P. C. Visser for his exploration of the Hunza Karakoram glaciers. Mr. Visser is an attaché at the Royal Netherlands Legation at Stockholm. He first visited the Himalaya in 1922, when with his wife, he made an interesting study of several of the glaciers of the Saser group of the Muztagh-Karakoram. In 1925 he visited Hunza and crossed from the head of the Khunjerab valley into the Ghujerab, which up till then had never been visited by Europeans. From the Ghujerab, he crossed to the Shingshal valley and successfully explored the great glaciers descending from the northern wall of the Muztagh-Karakoram. He then returned to the Hunza river and explored the great Batura glacier throughout its length.

Mr. Visser is a fine climber and has been a member of the Alpine Club since 1913. His wife, who accompanied him on both his expeditions, is vice-president of the Ladies' Alpine Club. Both are Honorary Members of the Royal Netherlands Geographical Society and of the Netherlands Alpine Club. Mr. Visser was awarded the Gold Plancius Medal of the Netherlands Geographical Society, the Medal for explorations in Asia by the Société de Géographie of Paris, and the silver Andrée Medal of the Royal Geographical Society of Sweden. The Société Royale de Géographie of Antwerp elected him an Honorary Member.

Mr. and Mrs. Visser have made a number of ascents in the Alps and in Norway, and are now engaged on their third Karakoram expedition, of which some details appear in another part of this volume.

THE SPELLING OF "KINCHINJUNGA." In common with that of many other Tibetan and Lepcha place-names on the map of Sikkim, the spelling of the name of the world's third-highest mountain has been woefully mishandled in every map and gazetteer hitherto published. In view of the increased public attention recently devoted to this region, the occasion seems opportune for suggesting the adoption of a more systematic scheme of orthography.

The best system of transliteration yet devised for Tibetan words is that of Sir Charles Bell,* which has been adopted by the Bengal Government. Under this system the romanized form of the mountain's name becomes *Kang Chhen Dzö Nga*. It is, however, the custom of the Survey of India, in the interests of briefness and legibility to modify slightly Sir C. Bell's system by (i) grouping separate Tibetan monosyllables into words as far as possible, and (ii) ignoring the slightly-sounded Tibetan aspirates and writing *Ch* for *Chh*, *Ts* for *Tsh*, etc. (e.g., *chu*, water, instead of *chhu*; *tso*, lake, instead of *tsho*). Thus we get the form "Kangchen Dzö-nga," which is recommended for adoption by the Himalayan Club, in the hope that the official gazetteer, which at present spells the word "Kinchinjunga," will some day follow suit. Although the employment of diacritical marks is rightly deprecated on modern maps, yet their use can never be entirely dispensed with, and, in the present instance, both the modification over the ö, and the hyphen which follows it are absolutely necessary in order to indicate the correct pronunciation of the second half of the name, which it is to be noted, has no connection with the well-known Tibetan word *dzong*, a fort.

It may be remarked that almost every Tibetan place-name has a meaning, usually of appropriate significance. Thus Kangchen Dzö-nga means "Big snow, five treasures"—with reference, presumably, to the five principal summits of the massif.

The Survey of India, which, under Government orders, adheres to the spelling used in the *Imperial Gazetteer* for place-names occurring in it, has for the present decided that the mountain will appear on its maps, thus :

KINCHINJUNGA
(KANGCHEN DZÖ-NGA).

H. T. M.

* *Grammar of Colloquial Tibetan*, by C. A. Bell; Bengal Secretariat Book Department, Calcutta; 2nd Edition, Rupees 3.

Note by Editor.

Sir Sidney Burrard, in his *Sketch of the Geography and Geology of the Himalaya Mountains and Tibet*, writes: "The name Kinchinjunga has been spelt in a variety of ways. Uniformity of spelling is of more importance to geographers than correctness. The correct forms are doubtless Kanchenjunga or Kanchendzonga, but the more familiar form of Kinchinjunga is that adopted in the new *Imperial Gazetteer*, and this, it is hoped, will now come into general use."

The two highest summits of the mountain appear in the Survey of India records as VIII and IX. *Kinchinjunga* was the spelling used by Hooker, who occasionally abbreviated it to "Kinchin." *Kanchinjunga*, *Kinchinjinga*, and *Kinchinjunga* are all used in the old Survey of India reports by Captain H. J. Harman and Colonel Tanner. *Kangchenjunga* is the spelling used by Mr. Douglas Freshfield and Dr. A. M. Kellas, and this has been adopted by the Royal Geographical Society. *Kanchenjunga* is the usual spelling of the leading press in India. There is thus no uniformity among experts or non-experts of the past or present, nor on maps or in the press of to-day; nor can we shelter behind convention and say that any one of these spellings has become sanctioned by usage.

The spelling *Kangchenjunga*, used in Colonel Tobin's article, and in the illustrations from photographs (including the frontispiece) by Mr. N. A. Tombazi, is the one preferred by them, and the one that I find by far the most generally used to-day, which shows that Sir Sidney Burrard's hope has not been fulfilled.* It has the advantage of being a compromise between the absolutely correct spelling, Kang-chen Dzö-nga, according to Sir Charles Bell's system of transliteration, which in this case is undoubtedly awkward, and the utterly incorrect spelling of the *Imperial Gazetteer*, and it has therefore been retained in this volume. The whole of the place-names of Sikkim, both on our maps and in the *Gazetteer* require careful revision by an expert.

A copy of the above note was referred by me to His Highness Sir Tashi Namgyal, the Maharaja of Sikkim, who has kindly authorized me to quote his views from a letter which runs as follows:—

"Our name of this mountain is written in Tibetan by a compound word which in English is *Kang-Chen-mdZod-iNga*, pronounced as *Kang-chen-zod-nga*, meaning, 'Snow, big, treasures, five,' or 'Five big treasured snow.' But you will see that it is so difficult for one to pronounce the word, if the Tibetan correct spelling is used in English, letter by letter.

"In the word *Kangchenjunga*, I see the first two words *Kang-chen* (snow-big) pronounce and convey the meaning correctly, but the last word *junga*, has no meaning in Tibetan. It really ought to be *Zod-nga* (treasure, five, or five-treasured). However, I have consulted Colonel Weir, and we both agree with you to leave it as *Kangchenjunga*, as it also appears from your enclosed note that this is by far the most generally used to-day."

* I may mention that Bauer spelt the word in the German version of his article Kanchendzonga, informing me at the same time that 'dzo' was preferable to 'ju' in German. The letter 'j' in German has of course an entirely different sound to 'dz.'

THE HEIGHT OF KANGCHENJUNGA is shown on maps as 28,146 feet. This height was derived from theodolite observations from six stations in the plains averaging 104 miles from the mountain and four stations in the hills averaging 47 miles from it.

In the *Geodetic Report*, Vol. I, published by the Survey of India, Dr. de Graaff Hunter has investigated the heights of both Everest and Kangchenjunga, taking into consideration the latest ideas of refraction, radiation and plumb-line deflection. His conclusions indicate that the height of Kangchenjunga is 28,227 feet above the geoid, with a possible error of 12 feet. The accepted height of K² is 28,250 feet, and until the observations to this peak undergo the same rigid analysis, it must be considered the second highest mountain in the world.

THE NAME "MAKALU." In a recent discussion on the nomenclature of individual Himalayan peaks, the statement that Everest is the only personal name which has been accepted by the Survey of India was challenged, and both the names "Godwin Austen" and "Makalu" for the second and fourth highest mountains were cited. As stated in *The Himalayan Journal*, Vol. I, p. 104, the name "Godwin Austen" was approved neither by the Survey or Government of India. The name "Makalu" has been held by some to be a corruption of *Macaulay*. There seems to be no justification for this assumption.

Captain W. S. Sherwill, in his *Notes upon a Tour in the Sikkim Himalayah Mountains* (J. A. S. B., 1853, VII, p. 615), remarks on the absence of a native name for this remarkable peak, and since his day no definite native name has been found. In the records of the Great Trigonometrical Survey of India, the mountain is entered as No. XIII, but in his *Narrative Report on the Sikkim Survey*, 1883-1884, Colonel Tanner wrote:—"With the exception of the Kinchinjunga peak, No. XIII or Makalu (27,990) is the finest yet fixed in the Eastern Himalaya" (*General Report of the Survey of India*, 1883-84). At about the same time, in 1884, the Survey of India explorer, Rinzin Namgyal, drew a panorama of the Nepal Himalaya, in which the mountain is figured as "Pk. XIII, Khamba Lung, 27,790 feet." Khamba Lung is evidently derived from the Khamba district of Tibet, which adjoins the mountain, while Kama-lung is the valley overlooked by it. Colonel Morshead has called my attention to the probable corruption of Kama-lung into Makalung by the transposition

of the consonants. It seems that this simple explanation is far more likely than that of a derivation from the name of a man, who, however distinguished he may have been, was unconnected in any way with the mountain. The fact that Macaulay was known as *Makalu Sahib*, must, I think, be treated as pure coincidence. The accepted height of Makalu is 27,790 feet from six stations of observation.

TO GILGIT BY AIR. In the *Journal of the United Service Institution of India* for April 1929, there is a brief but most interesting account of the flight of four Wapiti aeroplanes from Risalpur via Chakdara, the Kotkai pass, and the Indus valley to Gilgit. Colonel J. F. Turner, Chief Engineer to the Air Force in India, who accompanied the flight and describes it, was for a few years before the war Military Engineer at Gilgit, and then toured extensively throughout the Agency. With ordinary ground methods of transport, with perfect arrangements and in perfect weather, the shortest time in which a traveller can normally reach Gilgit is twelve days, through Kashmir, and even this necessitates double marches throughout, over two passes which are liable to be blocked by snow. The four Wapitis left Risalpur at 7-30 a.m. on the 28th March and landed at Gilgit almost exactly four hours afterwards, including a halt of an hour and twenty minutes to re-fuel at Chakdara. Apart from the advantage of thus drawing closer this distant frontier outpost, there is a very special geographical interest in the flight, for the machines passed over that part of the Indus Kohistan into which no British officer or European has ever penetrated.

The Wapiti planes reached the Indus in eleven minutes from the Kotkai pass, and all thoughts of engine trouble were soon dispelled by the magnificent scenery. From here up to Sazin, opposite the Darel and Tangir valleys, the Indus flows in a stupendous gorge. Colonel Turner writes : " To see the ribbon of river which is 2000 feet above sea-level, below, one had to look over the edge of the cockpit, whereas, close alongside the wings, the mountains rose in some places to over 15,000 feet in one slope, which consisted of precipice after precipice with a few stone slopes to vary the monotony. The flight travelled at about 12,000 feet. The only possible description of the hill-sides is that they equalled the worst markhor ground. " For most of the way there was no track on either side of the river, and it is hardly to be wondered at that this Indus Kohistan is peopled by separate communities of small independent tribes, tucked away in

tributary valleys. Except during the summer and at great heights there is little communication between them.

This gorge of the Indus, which was traversed about A.D. 403 by the Chinese pilgrim Fa-hsien, and described by him as the "Route of the Hanging Chains," has not yet been penetrated by Europeans, though the tributary valleys and Swat have recently been surveyed. Our maps of the gorge itself are still dependent on the old route traverse of "the Mullah,"—Ata Mahomed, of the Survey of India—who in 1876 followed the Indus throughout its course from Attock to Bunji.

The point where the planes met the Indus valley is just north of Pir-Sar, now identified by Sir Aurel Stein as Aornos, the famous rock-stronghold captured by Alexander the Great in 326 B.C.* What would the Macedonian have given to have included among his weapons of war four 'Wapitis'! Or would he, if he had watched them flying overhead from the Kotkai pass to the Indus, *in eleven minutes*, have refused, like the Wazir of Chilas in 1929, to believe that there were men inside them!

We can imagine the excitement at Gilgit. All the Mirs and chiefs of the Agency were collected to see the wonderful "flying carpet" of the Sirkar. Few had ever been south of the mountains or seen even a wheeled vehicle. None had ever set eyes upon an aeroplane. From the time the machines appeared in their strikingly regular formation until they were parked in front of the assembled crowd, there was an amazed and awe-struck silence. Then as the noise of the engines died down, tongues were loosened. The old Mir of Nagar, bolder than the rest, clambered up the side of a plane. The less-travelled tribesmen were not sure if their chief's familiarity was great daring or gross sacrilege. One wanted to know what sort of inhuman monster was hidden inside, turning the thing that the more sophisticated termed a "punkah."

This flight records one more triumph of the air. Gilgit, our northernmost outpost, has been linked up with India. The raiders of Tangir, Darel, and of the other little republican States and unadministered independent territory, enclosed by Gilgit, Swat, Chitral and Hazara, will have realized that they are no longer immune from punishment; and already the gentle suggestion of an aerial visit by

* See Review on page 151.

the Political Officer at Gilgit has settled with blood money an account opened by certain Darelis.

PEAK KAUFMANN. The mountain known to us as Peak Kaufmann, and believed up till 1929 to be the highest mountain summit in Russian territory was climbed in September 1928 by a party of German climbers, and its name was changed to Peak Lenin. According to Dr. Longstaff in the *Alpine Journal*, Vol. XLI, p. 160, it "was named after the celebrated Russian General, Constantine Petrovitch Kaufmann, conqueror and Governor-General of Russian Turkistan from 1867 till his death at Tashkend in 1882. He took Samarkand in 1868, also Khiva, Bokhara and Khokand. His advance was the main cause of the British-Afghan war of 1877-8."

The Pamirs and the neighbouring mountains have many honoured names, some of which symbolize the end of the old Anglo-Russian suspicion. We have the Nicolas Range, Lake Victoria, Peter the Great Range, Peak Salisbury. These names are international.

Presumably every nation has a right to call its mountains what it likes, though personal names are as a rule objectionable and unsuitable. But once the name of a man has become attached and accepted internationally, there is no need for other nations to discard that name and adopt a fresh one merely because there is a change of government in the country concerned. Everest has remained, not altogether because of the great scientist it commemorates, but partly because the name itself has a poetic meaning in our language. Let those who feel the same poetic sympathy for the name of Lenin adopt that name, while the rest of us keep the traditional one of Kaufmann.

Some prophets in the East may see in the discovery of Garmo, a peak in the Russian Empire higher than the one some now prefer to call Lenin, the birth of a genius greater than his, and one which may restore the fortunes represented by the name of Kaufmann.

THE EIGHT LONGEST GLACIERS IN ASIA. The discovery by the Russo-German Alai-Pamir Expedition, 1928, of the great length of the Fedchenko glacier moves all our Karakoram glaciers one down on the list of the world's longest glaciers. Up till this discovery the Siachen had been believed to be the longest glacier outside sub-Polar regions, while the Fedchenko, or the Sel-dara, as it was shown on our maps, was believed to be only about fifteen miles long. The

following table shows some details of the eight longest known glaciers outside sub-Polar regions :—

Glacier.	Region.	Length (miles).	SNOUT.	
			Height (feet).	Latitude.
Fedchenko ..	Trans-Alai	48	9880 approx.	39° 05'
Siachen ..	Karakoram	45	12,150	35° 10'
Inylchek ..	Tien Shan	44	9100 approx.	42° 02'
Hispar ..	Karakoram	38	10,500 approx.	36° 10'
Biafo ..	Karakoram	37	10,360	35° 40'
Baltoro ..	Karakoram	36	11,580	35° 40'
Batura ..	Karakoram (Hindu-Kush sec.)	36	8030	36° 31'
Koi-Kaf ..	Tien Shan	31	11,320	41° 51'

No glaciers, other than the above, exceeding thirty miles in length are known outside sub-Polar regions.

The Siachen glacier was discovered in 1848 by Henry Strachey, who ascended it for two miles from the Nubra (*J. R. G. S.*, 23, p. 53). In 1862, Mr. E. C. Ryall, Survey of India, sketched the lower part of the glacier, but he ascribed to it a length of only 16 miles. In 1835 the traveller Vigne approached it from the west via the Bilafond glacier, but never guessed its existence (*Travels in Kashmir*, Vol. II, p. 382). In 1889 Sir Francis Younghusband approached it from the north, and saw but did not reach a col on its northern watershed. In Sir Sidney Burrard's *Sketch of the Geography and Geology of the Himalaya Mountains and Tibet* published in 1907, the Siachen is not among the long glaciers of Asia. It was Dr. T. G. Longstaff in 1909, who, with Dr. Arthur Neve and Lieut. Slingsby, first crossed on to the upper Siachen and first discovered its great length. It has since been completely surveyed by Grant Peterkin of the Bullock Workman expedition in 1912.

Prior to this discovery the Inylchek was believed to be the longest glacier outside sub-Polar regions. The details given above are from Merzbacher's map of the Tien Shan, 1928. Merzbacher's own height for the snout of this glacier was 9650 feet, but reliable newer Russian

surveys have modified his heights. The Inylchek comprises two long parallel branches of approximately the same length, which enclose Khan Tengri, the great peak of the Tien Shan (the latest height of which is 22,800 feet, from Russian surveys), and which combine about eleven miles from the snout. Merzbacher explored the southern branch for about 35 miles (*Petermann's Mitteilungen*, Supp. Vol. 109, 1904).

The data of the Hispar, Biafo, Baltoro and Batura glaciers are from the reports of the Survey of India, modified by the later explorations of Sir Martin Conway, the Workmans, the Duke of the Abruzzi, and the Vissers. Those of the Koi-Kaf are derived from Merzbacher.

THE SHINGSHAL GLACIERS. A most interesting report on the positions of the snouts of the Shingshal glaciers of Hunza in the early months of 1908, written by Captain F. H. Bridges, who was stationed at Gilgit at the time, has just come to light.

Captain Bridges left Pasu on 21st April and made his way up the bottom of the Shingshal gorge to Dikut, fording the river twenty times. Here he joined the normal route by the Karun Pir. The snout of the Malangutti glacier was across the river, which flowed beneath it, and reached within fifty yards of the conglomerate cliff opposite. Bridges reports that in 1907 he was told that the glacier had closed on the cliff and held up a lake 150 feet deep, which was released in September. A comment by the District Engineer at Gilgit states that in April 1907 the snout was 100 yards from the cliff and that there was no lake in August. He dismisses this block and lake as fictitious. There was actually no serious flood in 1907 nor does there ever seem to have been any glacier block caused by the Malangutti in recent years. It is probable that the Shingshal has always been able to maintain a channel either round or under the ice.

Bridges reached Shingshal on 23rd April and the following day moved up to the Yazghil glacier. He found the glacier divided into two snouts about three-quarters of a mile apart. The upper snout was 48 yards from the rock and conglomerate cliff opposite; the lower only 10 yards from it. The lower snout was about 500 yards wide, the upper about a thousand. A considerable stream issued from this glacier, but the Shingshal bed above it was dry.

It is Bridges' account of the Khurdopin and Yukshingardan glaciers (which he calls *Khurdarpin* and *Shungdickt*), which is of especial interest. The combined glacier had been seen in 1892 by

Lieut. Cockerill, and called by him the *Verigerap*. Bridges was the first to discover the snout of the Virjerab about a mile and a half upstream of the combined snouts of the two lower ones. Bridges writes : " The united glaciers of Khurdarpin and Shungdict, sweeping past the mouth of Vergerap, and impinging along the whole cliff-face below Vergerap for about $1\frac{1}{2}$ miles, have enclosed a large open space at the mouth of the Vergerap nullah, and it is in this space that the lake gradually collects. "

Bridges carefully examined the Khurdopin dam and a surveyor was afterwards sent up to take measurements, which have been entered in the margin of his report. The lake impounded by the dam at the time of the surveyor's visit was about two miles long, about 150 feet deep at the dam and 25 feet deep at the upper end. The water-level (as pointed out by Shingshalis) to which the lake rose in 1907 showed a depth at the dam of 290 feet before the dam burst. Perhaps the most interesting feature of the report is the record of this 1907 flood. The ice appears to have been about 330 feet high when this pressure of the lake, 290 feet deep, burst a channel about 50 feet wide and a hundred feet deep through the top layers of the ice. This channel appears to have acted as a safety valve. The waters released took eleven days to empty and the maximum rise at Bunji was only 7 feet.

Another interesting point is the fact that the lake observed by Bridges, though then 150 feet deep, seems to have dispersed even more harmlessly, for there is no record of a flood of any consequence since 1907.

Though Bridges wrote so interesting a report on the snouts of the glaciers, he had little conception of their size, and it was not till the expedition of the Vissers in 1925 that they were explored throughout their length and surveyed. Captain Bridges' report was accompanied by a sketch map and eight monochrome sketches. A copy of the report, sketches and map are now available for reference in the Club library, and another copy may be found at the Royal Geographical Society in London. It is a pity that a record of exploration of such surpassing interest to glaciologists should have been buried so long and forgotten.

THE WAY TO THE BASPA. On page 71 of the first volume of *The Himalayan Journal*, Major Shewen described an accident that occurred at the Soldang Gad, between Taranda and Nachar. As this account has had the effect of deterring a traveller from making

the journey, it seems desirable to point out that accidents are not frequent. The following is an extract from a letter of a well-known member of the Club, who knows the Hindustan-Tibet road well :

“ To me it seems perfectly absurd to cancel a march up the Hindustan-Tibet road because one man was killed by a falling rock. One might as well refuse to walk the streets of London for fear of a motor running on to the pavement. I have been along these Taranda cliffs many times, often after heavy rain, and until I heard of Shewen's accident, I had no idea that there was any special danger at this point. In the Himalaya there is always some risk of falling rocks.... but I have had more narrow escapes in half an hour on the Kashmir road during heavy rain than I have had in all my travels elsewhere.”

The following extract is taken from a letter from a traveller up the H. T. road in 1929 :

“ Rain stopped at 9 a.m. The cliffs on the Taranda spur are said to be dangerous after rain, so we waited till 11 a.m. to make a start. On arriving at the spur, just beyond mile 107, it was obvious that since the rain had stopped (2½ hours earlier) there had been a heavy fall of rock. There were deep dents in the sodden soil of the path where large boulders had landed ; and on the rocks at the right-hand side of the path were fresh scars and dry powder, which showed how large and how recent the fall had been. As a matter of fact the road itself was not blocked as it is so narrow, and the slope of the cliff so steep that boulders would not stop there if they fell from a height. I should say, however, that except after snow or heavy rain the road is absolutely safe ; and if one is cautious (as I fortunately was) there is no danger—or very little.”

THE SURVEY OF THE BASPA VALLEY. As suggested by Mr. W. E. Buchanan on page 75 of this Journal, the Survey of India map 53 I, scale 1 inch=4 miles, has not been revised for a long time and is from very old surveys. The 1916 edition is merely a reprint of the old Atlas map with the longitude changed. As far as I have been able to ascertain, the lower part of the Baspa valley was sketched in July 1851 by Mr. James Peyton, sub-assistant of the Survey of India, during the triangulation of the Sutlej valley (Sutlej-Spiti-Chandra series). The upper part of the valley seems to have been surveyed later. The history of the junction between the surveys of the Bhagirathi and Baspa is most interesting. In the early summer of 1853, Mr. J. Dyer, 1st class sub-assistant, carried a series of minor triangulation up the Bhagirathi, but failed through bad weather to ascend or

cross the Great Himalaya near the Nela pass. A second attempt was made in October the same year, both from the Bhagirathi and from the Baspa, Mr. Mulheran following the route that leads along the southern face of the watershed, while Messrs. Shelverton and Dyer attacked it from the Baspa side. It was, I believe, at this time that the main valley of the Baspa and the passes leading into it were sketched. Once more bad weather intervened and the attempt to effect a junction was abandoned. The range was eventually conquered on 13th May 1854 by Mr. W. H. Johnson, who placed a station on the watershed at 19,069 feet above sea-level, a quarter of a mile east of the Nela pass. Mr. Johnson reached the Nela pass from the Baspa side and triangulated the whole of the Baspa valley, about 35 miles as the crow flies. The only surveys that appear to have been based on this triangulation were patches of forest survey done in 1885 on the one-inch scale, and smaller isolated patches of forest survey done later on the four-inch scale. These were too late to be incorporated in the "Atlas map," and as this has never been re-drawn they were not included in the reprint of 1916. Too much reliance should not therefore be placed on the details of the side valleys and upper regions shown in the existing map, as they were almost certainly sketched from a distance and based on insufficient triangulation.

THE BOMBAY NATURAL HISTORY SOCIETY was founded in 1883 for the purpose of "exchanging notes and observations on Zoology and exhibiting interesting specimens of animal life." Its funds are devoted entirely to the advancement of knowledge of the Zoology and Botany of the Oriental Region.

The Society consists of Life Members, Ordinary Members and Honorary Members. Life Members pay an entrance fee of Rs. 20 and a Life Membership fee of Rs. 350. Ordinary Members pay an entrance fee of Rs. 20 and an annual subscription of Rs. 25. The terms are the same for members residing outside India. Its famous Journal, as a scientific publication, is one of the most important issued in the East. On the popular side its articles and illustrations appeal to the sportsman and the naturalist the world over. Of particular interest to members of the Himalayan Club are the wide and varied range of articles which have appeared in its Journal dealing with the Fauna and Flora of the Himalayan Region. The Mammals, Birds, Butterflies and Snakes of the Himalayan and trans-Himalayan provinces have been dealt with in its pages in numerous articles and notes. A serial, illustrated in colour, on

Indian Wading Birds and on Beautiful Indian Trees is now current in its issues. A feature of the Journal is the section, "Miscellaneous Notes." These form a fascinating record of observations and experiences of individual members on many interesting phases of Natural Life. Members receive the Society's Journal post free. The Society is always willing to correspond with members on matters connected with Natural History and to offer assistance or advice to private collectors of Zoological material. The Society's Taxidermy Department is at the service of members who wish to have their trophies mounted.

Ladies and gentlemen wishing to join the Society should communicate with the Honorary Secretary, Sir Reginald Spence, *Kt.*, 6, Apollo Street, Bombay.

SKI IN THE HIMALAYA.—Though the chief centre for ski-ing in the Himalaya is Gulmarg, in Kashmir, every winter sees people out on ski in Kangra, above Dharmasala (where Gurkha soldiers have been taught to ski), at Razmak and in Chitral; whilst before the Afghan debacle, the British Legation at Kabul found ski-ing made a great difference to the long winter months.

A couple of years ago an officer on a shikar trip in Kashmir covered a portion of his journey on ski, taking an hour and half to his coolies' six. This year a member of the Ski Club hopes to collect a small party to go up the Liddar valley in April for a run down the Kolahoi glacier on ski.

The first actual meeting of the Ski Club of India on snow was at Rashmin, in the Safed Koh, beyond Parachinar, in 1926, when Wing Commander Walser, Major Noel and Major Dyce put in two days there just before Christmas. This was a somewhat informal affair and the first advertised meet of the Club was held at Gulmarg in March 1927. Since then meetings have taken place every Christmas and March with increasing numbers.

Forty-one people were up at Gulmarg last Christmas, amongst them being several members of the Himalayan Club. There will also be a certain number up there in February, March and possibly April, for snow goes through the same variations as in Europe, and spring ski-ing is as good as that to be had in winter.

Five feet of snow fell before Christmas, a good deal more than is usual at this time of year. It was therefore possible to hold straight races for the Lillywhite and Walser Cups without fear of rocks. When through lack of snow straight racing is unsafe, Slaloms

(a form of bending race) are held. The race for the Lillywhite Cup, which is recognized by the Ski Club of Great Britain as a "British Ski Race," was won by Flight-Lieut. Rhys Jones from eleven starters, two of whom were gold-medal skiers. The Walser Cup for skiers of moderate ability was won by Captain Showers of the 1st K.G.O. Gurkhas. Apharwat, 13,800 feet, was ascended on ski several times and gave good running at first, but the summit latterly become wind-swept and difficult.

The Club has now two "Alpine" huts—one, "Moon Hut" on Kilanmarg, the other, "Hadow Hut" at Linyan Marg; both are very useful, the latter enabling good ski-ing to be obtained until early May. The Ski Club hopes to establish other Alpine Huts along the Pir Panjal range. Three years ago this country was reconnoitred in summer by Major Dyce, with a view to ascertaining its ski-ing possibilities, and found to be eminently suitable for ski-touring. Shin Mahinyu, 15,111 feet, looks a perfect ski-mountain. Possibly the two Clubs could co-operate to some extent in the erection of Alpine Huts.

REVIEWS.

INNERMOST ASIA*: DETAILED REPORT OF EXPLORATIONS IN CENTRAL ASIA, KAN-SU, AND EASTERN IRAN.—BY SIR AUREL STEIN, K.C.I.E., Indian Archæological Survey. *Oxford: The Clarendon Press*, 1928. *Four Volumes*. $13\frac{1}{2} \times 10\frac{1}{4}$ (Super Roy. 4to.). Price £26 5s.

IT is with a certain amount of awe that a reviewer of Sir Aurel Stein's magnificent volumes, "Innermost Asia," approaches his task; and it is only when he has settled down and realized that the ordinary mortal can find no fault with them that the duty becomes a real pleasure.

From time to time within the last twelve years, Sir Aurel has given us brief anticipations of what was to come, by publications in various journals and periodicals. The *Geographical Journal* published in August and September 1916 a general account of the expedition, compiled soon after the return. In January 1920 a more detailed

* This Review is re-published by permission of *The Statesman*, Calcutta.

account of the explorations in the Lop desert appeared in the *Geographical Review*. On 3rd November 1924 Sir Aurel Stein delivered before the Royal Geographical Society the first "Asia Lecture"—*Innermost Asia : Its Geography as a Factor in History*. And on the publication of his maps which were to accompany the full report of his last expedition, the Survey of India published in 1923 on his behalf a *Memoir on the Maps of Chinese Turkistan and Kansu*, upon which maps they had been engaged for five years.

All these papers are introductory or supplementary to the present "Report," and the fact of having read them stimulates rather than lessens interest in the latter. This beautiful production of the Oxford University Press reflects the greatest credit not only on the distinguished author, but also on the Government of India. Printers and publishers alike are to be congratulated on the completion of such a work, while Messrs. Henry Stone and Son of Banbury, and the Survey of India Offices at Dehra Dun deserve great credit for the beautiful plates and maps. The publication comprises four volumes, *Super Royal quarto*, of which the first two contain the text, appendices and topographical plates ; the third is devoted exclusively to a very full series of 137 full-page plates illustrating the archaeological finds and 59 pages of archæological site-plans ; while Volume IV is a portfolio containing some fifty maps. No fewer than nineteen specialists have been engaged on critically examining and reporting upon the various art-relics and manuscript-remains, to say nothing of officials and friends who have been enlisted by Sir Aurel Stein's tactful persuasiveness before, during and after the expedition.

The author enters an early apology that exacting claims on his time since his return have not allowed him to publish a personal narrative. Those who have followed his later explorations on the North-West Frontier, particularly on Alexander's tracks, both in Swat and Baluchistan, the ancient Gedrosia, will readily accept that apology, especially in view of the accounts in the periodicals already mentioned, and the brief summary given in the Introduction to this Report.

The expedition commenced in July 1913 and closed in March 1916. Taking the direct route from Kashmir by the Barai pass (which in 1922 was converted into a well-engineered road fit for transport ponies throughout), Sir Aurel reached Chilas and first explored the two small tribal states of Darel and Tangir, south of Gilgit, which were at that time under the rule of Raja Pakhtun Wali. Darel, in particular, afforded him investigations of much interest, for it was

visited by those two famous Chinese pilgrims, Fa-hsien and Hsüang-tsang. Then travelling through Yasin, the "Little Po-lu" of the Tang Annals of China, Sir Aurel crossed once again the Darkot glacier pass and the Taghdumbash Pamir, both traversed by Chinese forces in the 8th Century A.D. and reached Kashgar in September. These early chapters are full of interest to the frontiersman, particularly in view of later political developments, which have once more closed Darel and Tangir to us.

At Kashgar Sir Aurel may be said to have commenced his circuit of the Tarim basin, which comprises the Takla-makan "sand-ocean," the pre-historic dried-up Lop sea-bed, the dead settlements and oases by the dying rivers.* Surrounding this basin lies the gravel glacia, with oases few and far between, and the arid loess-covered spurs ascending to the snow-bound summits of the rim.

From Kashgar he first traced an ancient route through the desert to Maral-bashi and attempted to cross the Takla-makan desert to reach the south-eastern termination of the Mazar-tagh, where it emerges from the sand on the banks of the Khotan river. This attempt was baffled by the terrific sand-ridges, but not before definite evidence had been secured that there had once been an ancient range, which was now almost completely effaced by wind-erosion. Sir Aurel's observations in this connection have since been supplemented by those of Dr. Emil Trinkler.†

A rapid march via the Yarkand river, through previously surveyed country, brought the traveller to Khotan, whence he marched 700 miles to the Lop desert, examining some ruined sites on the way. Here he spent the winter, mainly engaged on archæology, and Sir Aurel devotes nearly three chapters to the fascinating work in this region. Perhaps the most remarkable of the 'finds' were the fine specimens of figured silks and woollen tapestries from grave-pits, "showing clear evidence of Hellenistic art-influence." Some of these textiles are wonderfully reproduced in colours in Volume III (Plates XXX—XLV). On one occasion he found the body of a young man with the head bare, the feet in strongly woven mocassins, lying as it was buried. Sir Aurel records the strange emotion of looking down

* A most interesting note on "River changes in the Eastern Tarim Basin," by Lieut.-Col. R. C. F. Schomberg, is printed in the *Geographical Journal* for December 1929 (Vol. 74, p. 574).

† See *Himalayan Journal*, Vol. I, p. 92 and *Im Land der Stürme*, pp. 161 sqq.

on the figure which, but for the parched skin and deep-sunk eye-cavities, seemed like that of a man asleep; and of finding himself brought face to face with one who inhabited, and no doubt liked, those strange and dreary Lop-nor regions, in the first centuries A.D. (page 264 and Fig. 173).

It was with the help of these relics of trans-Asiatic traffic that Sir Aurel subsequently traced the route which the Chinese had followed in their earliest trade-enterprises towards Central Asia, across the forbidding salt-encrusted bed of the pre-historic Lop sea, and the desolate wastes surrounding it. The story of this journey is of fascinating interest, for it was almost beyond hope that any surface relics could exist so many centuries after the route had been abandoned. Yet Sir Aurel records that as they traversed the barren clayey *shor* and hard salt-crust, chance repeatedly helped them almost uncannily.

Again and again finds of early Chinese copper coins, sometimes as fresh as if they had been minted the day before, small metal objects, stone ornaments and the like, assured him that he was still near the ancient track along which Chinese political missions, troops and traders had toiled for four centuries. On one occasion when the last traces of ancient vegetation had long been left behind, he suddenly found the ancient track plainly marked for about thirty yards by two hundred and eleven *Wu-shu* (Chinese) copper coins (Pl. CXIX, 12). They lay in a well-defined line, no more than three or four feet wide, running north-east to south-west, and must have dropped unobserved from some leaky money-bag or case. The swaying of a camel would account for the width of the track thus marked. What a romantic story could be based upon those copper coins carried by the last camel of the last caravan that used this awful route, so full of peril and hardship! It was by such 'lucky' finds as these, a chance coin, a scattered heap of bronze arrow-heads, an iron snaffle-bit, a broken copper buckle, and by his amazing ability to pick up and piece together his clues that Sir Aurel was enabled to trace this route right up to its eastern end, near an old terminal basin in the Tun-huang desert.

Sir Aurel Stein was in April 1914 once again on familiar ground, tracing the extensions of the Emperor Wu-ti's wall, that ancient Chinese border-line, similar in character to a Roman "Limes," and searching the ruined watch-stations in continuation of the line which in 1907 he had discovered and explored. Chinese records on wood prove that this portion of the "wall," which has now been examined

for close on 400 miles, was constructed about the end of the 2nd century B.C. as a defence against the Huns, and was garrisoned down to later Han times. The temptation to revisit the famous temples of the "Thousand Buddhas," south-east of Tun-huang, was too much for Sir Aurel, and his visit was not entirely devoid of results, in spite of the destructive effect of the order of the Peking authorities for the removal of the manuscripts left behind in the walled-up chapel when first explored in 1907.

Sir Aurel's next goal was southern Mongolia, and we find him exploring remains of Tangut and Mongol domination at and near the site of Khara-khoto where he was able to trace the old canals leading eastwards to abandoned farms. Then, with the heat rapidly increasing, he passed south, surveying as he went, and reached Kanchou, whence he set out for the high ranges of the Nan-shan. Here he met with a serious riding accident; his Badakhshi horse reared and fell backwards upon him, crushing the muscles of his thigh. It was not till the end of September, after a month's arduous travel over the barren Pei-shan ranges and the eastern extremity of the Tien-shan, that he reached Dzungaria.

In the first week of November the whole expedition was re-assembled at Kara-khoja, in the centre of the Turfan depression, where the winter was spent, and where, in spite of the previous visits of various German expeditions, important finds were made. Particularly ample results rewarded the exploration of a large burial-ground near Astana, the tombs yielding abundant relics of the early Tang period, such as figured silks, stucco figurines, and other objects of artistic interest (Plates LXXVIII—CVIII). During the winter the detailed survey of the Turfan depression on a scale of one inch to a mile, with carefully observed contours, was taken in hand. This depression descends to more than a thousand feet below sea-level. Sir Aurel himself, with his remaining assistants, concentrated his energies on the debris-filled ruins of Kao-chang, the Turfan capital during Tang rule (seventh to eighth century A.D.) and during the subsequent Uighur period. By February 1915, he had completed all he could hope to do at the time, and we find him supplementing the surveys of his assistants.

Meanwhile Rai Bahadur Lal Singh of the Survey of India, Sir Aurel's most energetic and devoted assistant on two long journeys, had been accomplishing important survey work in the Kuruk-tagh, and in the face of great physical difficulties and risks had carried his frame-work of triangulation south-eastwards to the vicinity of the

Lou-lan ruins. Amidst icy gales and with the temperature falling well below zero Fahrenheit, he was at last able to view above the desert loess-haze the high snowy peaks of the Kun-lun, 150 miles to the south.

Early in February 1915 Sir Aurel started his large camel convoy of fifty animals on their two months' journey to Kashgar, and some days later, after some mild Chinese obstruction, he was able to follow; Lal Singh taking a more northerly route high up in the mountains of the Tien-shan.

One hundred and eighty cases of antiques were safely despatched from Kashgar, and in July Sir Aurel started across the Russian Pamirs for the valleys of the upper Oxus. Passing down the great Alai valley, he followed the ancient silk-route from China, and crossing the high ranges which divide the main feeders of the Oxus, reached the Alichur and Great Pamirs, where he traced the routes of armies and Buddhist pilgrims. There is a most interesting account of the effects of the great earthquake of February 1911 in the Bartang gorge. Huge land-slides had choked up the whole river passage and destroyed whatever tracks had once existed. The big river, at one time rivalling in volume the main feeder of the Oxus, had now ceased to flow. Sir Aurel was here four years after the block had been formed. It would be most interesting to know whether the river has since burst the dam or found an exit elsewhere.*

There are fewer details about Wakhan, Charan, Roshan, Shugnan and Darwaz, the western valleys of the Pamir massif, than we should like to have, but here the journey seems to have been somewhat hurried, or perhaps the author is bound to secrecy. Sir Aurel eventually reached Samarkand, whence he took the Trans-Caspian railway to the borders of Persian territory, and closed his travels with an important and most instructive journey of three weeks' duration along the Perso-Afghan border. He subsequently devoted two months to archæological work at ancient sites in Persian Sistan.

This rapid survey perhaps gives little idea of the amazing capacity for work and travel possessed by Sir Aurel Stein. The archæological results are far too important to be summarized, and can only be appreciated by an examination of the volumes, with the

* I see that one of the members of the Russo-German Alai-Pamir expedition of 1928 found the lake which had formed behind the block still in existence.

careful descriptions at the end of each chapter and the illustrations in Volume III. In that volume are some remarkable reproductions, particularly those in colour, which show the state of civilization reached, and whence it was derived. The seventeen appendices, obviously the work of experts, deal chiefly with inscriptions, manuscripts, ancient records, &c., and are mostly too abstruse for the ordinary reader.

The collection of antiquities was at first deposited at the Technical Institute of Kashmir, where the thousands of objects were arranged, studied and described, with the help of Mr. F. H. Andrews, the late principal of that institution and Sir Aurel's artist-friend and helper since his first Central Asian expedition in 1901. Under the orders of the Government of India, it is to be housed at New Delhi, excepting representative specimens which are to be presented to the British Museum. The main collection is now there in two temporary places of deposit. Reference to originals will therefore in most cases necessitate long journeys to the East for continental students. In this connection it seems worth mentioning the impressive manner in which the art-relics, frescoes and manuscript-remains, brought back by the four German expeditions to the Turfan oases and cave-temples further west, have been housed and are exhibited in a specially constructed building of the Ethnographic Museum of Berlin. This example, or precedent as we would call it in India, might well be followed by the authorities in this country, before damage or destruction befalls these priceless treasures.

Important as are the archæological results of this expedition, it is the geographical results that will appeal to many who, from afar, take an interest in Central Asia, for they are more easily appreciated. When Sir Aurel Stein returned in March 1916 to Kashmir, his expedition had lasted close on two years and eight months, and he himself had covered an aggregate marching distance of nearly 11,000 miles. It is possible that his survey assistants had covered even more, for they were often detached on survey work, when he himself was engaged at some fixed site. The forty-seven map-sheets on the scale of 1 : 500,000, included in the portfolio (Volume IV), cover no less than twenty-eight degrees of longitude and eight degrees of latitude, and are the combined result of the three Central Asian expeditions of Sir Aurel Stein. They probably represent a greater addition of concentrated geographical knowledge than any yet accumulated by any single individual in history. The maps themselves are beautiful productions, and reflect great credit on the Survey of India Drawing

and Reproduction Offices at Dehra Dun. The surveys in these areas were executed by Rai Bahadur Lal Singh, Rai Sahib Ram Singh, Mian Afraz Gul Khan (now Khan Sahib) and Sir Aurel Stein himself, and were based on triangulation executed almost entirely during the expedition by Lal Singh. The leader pays high tribute to him, and to the energy and capacity of Afraz Gul, whose selection and subsequent appointment to the Survey of India were due to Sir Aurel. A convenient index map is invaluable to the study of the rest, and a glance at this shows the vast amount of ground covered. On the maps is a mass of detail, for by judicious selection of a variety of symbols, not only the topographical features, but also the nature of the surface and of the various types of vegetation, whether living or dead, are indicated.

The Dedication is to the Memory of General Sir Henry Rawlinson, Bart., "whose labours in the field and study illuminated the Ancient History of Asia." Needless to add, there is a copious bibliography under the heading "List of Abbreviated Titles," and a full and complete general index of 36 pages, while in the Introduction Sir Aurel is more than generous to those who, in however small a way, were able to further his plans.

It must be with intense satisfaction that Sir Aurel Stein looks back over his three great expeditions into Central Asia. Whatever has been accomplished since his first fruitful journey in 1900-01, by members of whatever nation we choose to name, has been directly due to the stimulation of Sir Aurel, though he himself would be the last to lay such a claim. Little by little he has penetrated unexplored Asia; the Lop sea and the Turfan depression have yielded up their secrets; the sand-buried cities have been uncovered; the Emperor Wu-ti's ancient wall, with its watch-towers and fortified posts have been traced for seven degrees of longitude and surveyed; the whole civilization seems to have been laid bare. The four parallel ranges of the Central Nan-shan, previously visited only by Potanin, Obruchev, and Kozlov, have been explored and mapped in detail; the headwaters of the Huang-ho have been reached and the Etsing-gol and Su-lo-ho traversed; in the north, the southern ranges of the Tien Shan, the arid Kuruk-tagh, and even the moist upland pastures of Dzungaria have been surveyed. Is it too much to hope that Sir Aurel Stein has not yet completed his journeys of exploration in "Innermost Asia"?

KENNETH MASON.

ON ALEXANDER'S TRACK TO THE INDUS.—BY SIR AUREL STEIN, K.C.I.E. *London: Macmillan and Co., 1928. 10 × 7 inches; xvi + 182 pages; illustrations and map. 21s.*

ALEXANDER! Aurel Stein! Are not these both names to conjure with and the two together a combination which immediately commands our attention and guarantees that we shall not be disappointed!

Of Sir Aurel it is only necessary to say that his previous books, such as “Desert Cathay,” “The Sand-buried cities of Khotan” and “Serindia,” have already taught us the high quality of his wares.

And as for Alexander the Great surely there is a romantic fascination about his name that appeals to all. In our earliest days the story of the all-conquering youth—scarce more than a boy—weeping because he had no more worlds to conquer, stirred our imagination; and later, when we knew more of the wonderful man who carried the arms and culture of Greece through Egypt, Babylon, Persia and Bactria into India, he seemed to us, as he liked to appear to his own companions, a demi-God—Alexander, Lord of the Two Horns.

So doubtless it was with Sir Aurel, for he tells us in his book that throughout his many years of study, travel and exploration in India, Chinese Turkistan and North China, his real interest and hopes had ever been centred in Alexander and the elucidation of his campaign. We may well imagine the joy with which he, in the spring of 1925, received the news that political conditions across the frontier were sufficiently settled to admit of his visiting the Swat valley and the country between it and the Indus.

The author calls his book, which tells us of that visit, “a personal narrative,” and, by presenting the results of his labour in this readable form, he enables the reader to travel at his side, as it were, to watch him gathering the slender threads of evidence as he goes along, unravelling them like some clever detective, checking the evidence on the ground, anticipating what may be ahead. Thus the reader soon becomes infected with the energy and enthusiasm of the author, shares in his hopes and fears, follows him in his quick perceptions and deductions and rejoices with him when the goal is won.

Without entering into details of Sir Aurel's movements it may be said that from Chakdara, in the vicinity of which Alexander probably crossed the Swat river, he worked his way up the Swat valley, spending four happy days among the extensive ruins round Birkot, one of which the author believes to be “apart from small votive

stupas, the best preserved of all ancient shrines that Indian Buddhist worship has raised."

Interesting as are these remains of stupas and monastic buildings, perhaps a still higher interest attaches to the ruins of the ancient stronghold on a hill near Birkot, for Sir Aurel is convinced that these are the remains of Bazira or Beira, the fortress which Alexander "contained" with a force under Koinos, whilst he himself attended to the siege of Ora, whither he had already despatched a force under Attalos, Akeltas and Demetrios.

From Birkot and all its attractions Sir Aurel dragged himself away and pushed on up the main valley, past the Stupa of King Uttarasena, the position of which was found to be accurately recorded by the Chinese pilgrim Hsüang-tsang, and thence to Udegram and "King Gira's Castle" which the author indicates as being probably identical with the Ora of the Greeks. Here again Sir Aurel found himself hot upon the tracks of Alexander; but it was not until, after a visit to the head of the Swat valley, he had passed over the watershed through Gorbund and Kana to Una-sar, that he again picked up the threads. There, indeed, upon Una-sar can we enter into his feelings when stumbling along in the dark at the end of a long] and arduous march Sir Aurel could, even in the gloom and in spite of weariness, see enough to experience "the growing conviction that Aornos was found at last."

Aornos, the Rock, which Arrian tells us had baffled Hercules, but fell to Alexander, and which has for years baffled all efforts to locate it, yields at last its secrets to one whose life-long dream had been to stand upon its summit and say "Aornos is found at last!"

The topographical features fit in with the accounts of Arrian, Curtius and Diodorus. There sure enough is the vulnerable point where Aornos joins the main ridge; there the natural ravine which defended it; and there above the ravine the minor feature which some of the bravest seized whilst the ravine was still being filled in to allow Alexander's "artillery and small arms" to provide covering fire for the final assault!

With unerring instinct the author points to it all and carries the reader with him in his absorbing interest and excitement. We are shown too how the modern name "Una-sar" is derived from "Avarna," of which no doubt Aornos was merely a Greek form.

At this point it should be stated perhaps that Sir Aurel shows admirable restraint in drawing conclusions from similarity in place-names. By themselves such evidence is admittedly misleading;

but when all other historical and topographical factors tend to support an argument, then indeed a similarity in names is of great value. It is in fact something like the examination of a piece of Chinese porcelain which may have upon it the mark of, say, the Emperor Kang Hsi; unless we have first satisfied ourselves that the paste, the glaze and the colours are what they should be in porcelain of that period, the mark upon the base is valueless, no matter how clearly it may be written.

The above will, it is hoped, be sufficient to indicate what an interesting tale the author has to tell and something of the manner of the telling. To say more would be to rob the readers of untold treasures. One point of interest will doubtless occur to the thoughtful reader, though reference to it in the book is only indirect, and that is the extent to which discoveries, such as Sir Aurel's, tend to strengthen our confidence in the general accuracy of the old historians and diarists. Whether it be Arrian, Megasthenes or Hsüang-tsang, as long as they adhere to what they actually saw or what they learned from really reliable sources (as opposed to mere fable) we find them wonderfully accurate in essentials.

In this book we have proved for us the general accuracy of Arrian's description of "the Rock" and the attack upon it, not to mention several instances of the power of observation of the Chinese pilgrims. As example of such confirmation by modern exploration in other localities one may mention the Great Stupa, raised by the pious King Kanishka over the relics of Gautama Buddha, described by Hsüang-tsang as being to the south-east of Peshawar city, where a few years ago—1910 I think—it was located and excavated, the relics being found intact in their beautiful bronze casket. Or again, one recalls the fact that the monastery at holy Shravasti was also described by the Chinese pilgrims as being at such a distance outside "the Gate of Tamarind Trees"; and there it was proved to be in 1908, an inscription leaving no doubt as to its identity.

Likewise it is but of recent years that excavations carried out near Patna have brought to light the foundations of those wooden walls and towers which Megasthenes describes as surrounding "Palimbothra," the capital city of Sandrakottos, as the Greeks called Chandragupta.

On the other hand, as in the case of Mount Ilam—the Hilo Mountain of Hsüang-tsang—it is sometimes difficult to reconcile the distances, especially when they be long, given by the Chinese pilgrims, though their topographical sense seems sound in all other respects

(see p. 169). This, of course, may often be due to errors in transcribing figures, but is it not possible that the curious manner in which the Chinese compute distance to-day (and they doubtless did the same hundreds of years ago) may have something to do with it?

We must remember that to a Chinese it may be, say, 25 li from the Malakand to Dargai, but the same Chinese would undoubtedly describe the journey from Dargai to the Malakand as being one of 35 or even 40 li; for going in that direction it is all up-hill, and steep at that! So may not some at least of these discrepancies be due to the fact that our pilgrim travelled the road in one direction only and estimated the distance in accordance with his experience of the difficulty of the journey rather than in strictly measured miles as we should do?

Finally it may be said that Sir Aurel's delightful book is one that can be heartily recommended for it is one which will appeal to the general reader no less than to the scholar and the student of Buddhist history. The photographs, of which there are good store, are in themselves a treat, whilst the maps and sketches serve well to enable us to follow the author in all his movements, arguments and deductions. At the end we lay the book aside with regret that we have come to the end of it, but hoping that the wealth of interesting features which Sir Aurel was only able to describe briefly may later become the field of systematic investigation and the means of enhancing still further our knowledge of that portion of Gandhara which long ago in days of prosperity rejoiced in the name of Uddiyana—the Garden.

H. L. HAUGHTON.

TRAVELS IN TARTARY, THIBET AND CHINA, 1844-1846.

HUC AND GABET.—A new edition of HAZLITT's English translation, with an introduction by PROFESSOR P. PELLIOU. *London: George Routledge & Sons, 1928. 9×5½ inches; two volumes, xiv+387 and viii+406 pages; 1 chart; 25s.*

THIS reprint of the Abbé Huc's famous classic makes a timely appearance in the attractive Broadway Travellers Series.

Professor Paul Pelliot contributes a scholarly and critical Introduction, in which, after a brief biographical sketch of the two Lazarist priests, he relates how they were instructed by Mgr. Mouly, the Apostolic Vicar of Mongolia, to leave their mission station in the Chih-li province of China, and to proceed north-westwards towards Urga in outer Mongolia in order to evangelize the nomadic Mongols of

the North. "You will go on from tent to tent, from tribe to tribe, from lamasery to lamasery, until God makes known to you the spot where He wishes you to make a definite beginning."

From what they learned in the various lamaseries, the two missionaries soon became convinced that "Lha-Ssa, the capital of Thibet and the seat of the Grand Lama, was, in the eyes of all the peoples of Central Asia, the very Rome of Buddhism." Contrary to their instructions, but greatly to the benefit of their subsequent fame as travellers, they promptly turned their steps from north-west to south-west, and in due course reached Lhasa, which city, somewhat unfortunately for their future ecclesiastical careers, subsequently proved to lie within the sphere of influence of a rival Vicariate.

In regard to the veracity of the narrative, Professor Pelliot writes: "The lasting success of the *Souvenirs* is due above all to the literary gifts of their author. Huc had eyes to see, and the power to recall what he had seen; but these very gifts have their counterpart in a somewhat ardent imagination, which led him on occasion to invent what he supposed himself to be merely reporting; he had the artist's instinct, which with a few lively touches heightens the colours of reality, at times too drab. Some writers used to make this a pretext for denying the actuality of the journey itself; but there is no question that Huc and Gabet really did spend some time in Lhasa. It must, however, be admitted that Huc went rather far in arranging his facts, and.....he cannot be trusted in details, even in those which concern him personally....."

Professor Pelliot concludes: "Huc, in writing up his *Souvenirs*, trimmed them liberally for public consumption. He 'invented' nothing, but he transposed his material in order to please, and he succeeded. The *Souvenirs* are an artistic creation which leaves the reader with the impression of a whole which is the more true for the very lack of exactitude in the detailed relation of facts. We should very much like to know more of what Gabet thought of all this. Huc's marvellously animated narrative has thrown into the shade his companion, who was both his elder and his chief. Huc must have put himself to the forefront straight away. From October 1846, the very day after the arrival of our travellers, the French Consul in Macao is already talking of MM. 'Huc and Gabet.' Current usage follows suit. It is our duty to-day to make an effort.....to re-establish the proper ecclesiastical order—Gabet and Huc."

With all this one can cordially agree. One has but to read Huc's very human narrative to be convinced of its essential truth.

His simple yet vivid style has enabled him to produce what must rank as one of the most delightful accounts of an expedition which has ever been written. How readily one can picture the two French priests setting out on their long journey, in the guise of Mongol lamas ; the gaunt hook-nosed Gabet with his long beard already grey (though his age was barely thirty-six), bestriding a tall "red" camel ; the short rubicund Huc on a white horse ; the servant mounted on a lean black mule and leading the two baggage camels. At this period, it must be remembered, there was no French Embassy in China and no treaty in favour of Europeans. All missionaries, or other travellers, who penetrated into the interior of China were, on discovery *ipso facto* liable to be put to death.

Huc's whimsical sense of humour, which made light of all obstacles and discomforts, is delightfully in evidence in his description of catching a louse and displaying it alive under a microscope for the edification of the Tibetan Regent in Lhasa (Vol. II, page 239) ; and again, in his many sly references to the somewhat dissolute Chinese mandarin Li-kao-an, the "Pacificator of Kingdoms," who was ultimately told off to escort the two priests back to China, and whose sole vestige of religion consisted of a fervent veneration for the Great Bear (Vol. II, page 285).

Like all travellers in Tibet, Huc and Gabet were naturally impressed by the many resemblances between the Lamaistic ritual and that of their own Catholic Church. Their explanation is interesting. The reformer Tsong Kapa (A.D. 1357-1419), to whom is chiefly due the form of liturgy in present-day use throughout Tibet, was himself, according to legend, during his youth in the Koko Nor region, the pupil of a Lama who appeared from the remote regions of the West—a man remarkable not only for his profound learning, but also for his singular appearance, his enormous nose, and his eyes which gleamed with a supernatural fire. After the early death of his teacher, Tsong Kapa in due course wandered to Lhasa, where his disciples ultimately became known as the Reformed or Yellow Cap sect of Buddhists. "May it not be reasonably inferred that this stranger with the great nose was an European, one of those Catholic missionaries who at the precise period penetrated in such numbers into Upper Asia. It is by no means surprising that the Lamanesque traditions should have preserved the memory of that European face It may be further supposed that a premature death did not permit the Catholic missionary to complete the religious education of his disciple, who himself, when afterwards he became an

apostle, merely applied himself, whether from having acquired only an incomplete knowledge of Christian doctrine, or from having apostatized from it, to the introduction of a new Buddhist liturgy."

Members of the Himalayan Club will probably be interested in Huc's reference to the mysterious Moorcroft. While in the Tibetan capital, the two priests had a long conversation with a member of the Kashmiri community in Lhasa called Nisan, who had been Moorcroft's servant during his residence in Lhasa from 1826 to 1838. Nisan informed them that Moorcroft had been killed by brigands in the province of Ngari when returning to Ladakh after his twelve years' residence in Lhasa. Huc and Gabet had previously never heard of Moorcroft, and their information, collected on the spot only eight years after the event, must be considered unbiassed and fairly conclusive. On the other hand, as they themselves point out, Nisan's story is in direct conflict with that of Moorcroft's fellow-traveller M. Trebeck who, in a letter to the Resident at Ludhiana dated Balkh, 6th September, 1825, announced Moorcroft's death on 25th August, 1825 at Andkon on the way from Herat to Balkh, whither he had been sent to purchase horses on behalf of the East India Company. The truth regarding Moorcroft's fate will probably never now be known with certainty.

To conclude: the two volumes are well-printed in old-face type, and adequately indexed. A modern map might well have been provided; it is impossible to follow the author's route in detail on the very small scale "contemporary" map which forms the frontispiece to Volume I. The translation, on the whole, is excellent, but the French origin is here and there apparent in occasional unexpected mistranslations of individual words; misprints and misspellings are not uncommon; the following corrections have been noted, *inter alia*, on a first reading:—

Vol. I, p. 180, l. 5.	for <i>inodorus</i>	read <i>malodorous</i> .
„ „ „ 222, „ 19.	„ <i>assumes</i>	„ <i>presumes</i> .
„ „ „ 233, „ 17.	„ <i>ordonnance</i>	„ <i>ordinance</i> .
„ „ „ 272, „ 8.	„ <i>undulating</i>	„ <i>ruminating</i> .
„ „ „ 297, „ 13.	„ <i>indurated</i>	„ <i>emboldened</i> .
„ II „ 2, „ 7.	„ <i>assumed</i>	„ <i>presumed</i> .
„ „ „ 81, „ 8.	„ <i>æries</i>	„ <i>eyries</i> .
„ „ „ 99, „ 3.	„ <i>spinage</i>	„ <i>spinach</i> .
„ „ „ 112, „ 27.	„ <i>hygeianic</i>	„ <i>hygienic</i> .
„ „ „ 213, „ 17.	„ <i>laque</i>	„ <i>lacquer</i> .

H. T. MORSHEAD.

THE PEOPLE OF TIBET.—BY SIR C. A. BELL, K.C.I.E., C.M.G.
Oxford : Clarendon Press, 1928. 9×6 inches ; xx+319 pages ; illustrations and two maps ; 25s.

THE LAND OF THE LAMA.—BY DAVID MACDONALD. *London : Seeley, Service & Company, 1929. 9×6 inches ; 283 pages ; illustrations and one map ; 21s.*

WE TIBETANS.—BY RINCHEN LHAMO (MRS. LOUIS KING).
London : Seeley, Service & Co., 1926. 9×6 inches ; 228 pages ; illustrations ; 12s. 6d.

ONE happy result of Tibet's seclusion is that the few books which attempt to interpret the country and people to the Western World are, almost without exception, written by authors having new and original information collected first-hand.

Sir Charles Bell's latest volume may be regarded as a sequel to his previous well-known book *Tibet Past and Present*. It represents a very successful effort to portray the daily life of the Tibetans in their own homes ; a task which has been carried out with the scholarly care and precision characteristic of the author, whose long and intimate acquaintance with the language and customs of the Tibetan people has given him unique opportunities for gathering a harvest of original observations.

Though the author disclaims any intention of attempting a complete study of Tibetan domestic life, he nevertheless presents a series of charming and sympathetic views of the people and their daily doings from the cradle to the grave. The following quotations from some of the twenty-seven chapter-headings must suffice to indicate the scope of his treatment : The Nobility, The Peasants, The Traders, Robbers, Women, Marriage, Children, Food, Ceremonial and Etiquette, The Last Rites.

The book is copiously illustrated with reproductions from original photographs taken by the author, who, it is pleasant to note, foreshadows the publication of further volumes dealing with various aspects of Tibetan life and culture—notably the religious life—which he has been compelled, through lack of space, to exclude from the present work.

As British Trade-Agent at Gyantse and Yatung for a period of sixteen years, Mr. Macdonald can claim to have lived in Tibet among the Tibetans for a much longer period than any other living European. His intimate knowledge of the Tibetan language from childhood and his instinctive sympathy with the outlook of the people, derived

from a certain measure of consanguinity, added to his official status, have—as Lord Ronaldshay remarks in his foreword—combined to render his long residence in the country particularly fruitful, and have enabled him to produce a book which may justly be described as a mine of information.

Mr. Macdonald's presentation of his subject resembles in a general way that of Sir Charles Bell, except that more space is devoted to religion and anthropology; the chapters on Government, Religion and the Priesthood are particularly good. The result is a story of lively interest to the general reader. The serious student will perhaps regret that Mr. Macdonald has not seen his way to place on record even more of the unique knowledge which he undoubtedly possesses. For example, he remarks (on page 56) that "Tibet is divided into thirteen provinces, which again are subdivided into fifty-three districts." It would be of the greatest interest to geographers if he could give in detail the names and exact locations of these thirteen provinces, together with the names and precise geographical boundaries of the districts which go to form each province. Such information has never yet appeared on any published map of Tibet.

The book contains numerous illustrations from photographs taken by the author, as well as several diagrams and a small general map on the scale of 1/10,000,000.

The third book under review, *We Tibetans*, is interesting as being the first English book written by a Tibetan lady. Rinchen Lhamo is a native of Kham, the easternmost province of Tibet; and her husband was formerly British Consul at Tachienlu.

The authoress, as she explains in her preface, knows very little English, and her husband still less Tibetan; both, however, talk fluent Chinese, which language is their normal medium of conversation. The book was accordingly written down in English by Mr. King to his wife's dictation in Chinese. It takes the form of some twenty short chapters in which Mrs. King sketches in simple language the life and religion of her country, and in which she is at pains to uphold the merits of Tibetan culture against the materialism of the Western World. Chapter six, entitled "Your Civilisation and Ours" is the keynote of the book; one is tempted to quote a few of the authoress' shrewd home-truths:—

"Civilisation is not bound up in material things. A civilised people must have a sufficiency of them and that is all. We have it. You have more than it. You have a great many things we have not. Wonderful things. Your electricity and the various uses to which it is

put, your steamers and trains and motor-cars and aeroplanes,..... But there is another aspect of the matter. People can do without these things, but if they are there everybody naturally wants them, and so life becomes very expensive..... Few can attain the luxuries, but all want them. Wealth means that you may have them, poverty that you may not ; if you have them you are respected by everybody, if you have not you are thought of little consequence. So wealth becomes the goal of endeavour, and men's minds are taken off other things we consider more important. And some people in their struggle for wealth or fear of poverty set aside the principles of right-living, even of humanity, sacrificing their souls to this strange god whom we have not."

Though some of Rinchen Lhamo's statements conflict with the evidence of Mr. David Macdonald and savour of special pleading, she has nevertheless put up a spirited defence on behalf of her country and produced a very readable little volume.

H. T. MORSHEAD.

BURIED TREASURES OF CHINESE TURKESTAN.—By ALBERT VON LE COQ. Translated from the German by ANNA BARWELL. *London : Allen and Unwin, 1928. 9½×6 inches ; 177 pages ; numerous illustrations ; 18s.*

It is only within the last thirty years that the ancient civilization of Central Asia has been made known to us through the patient labours of various archæological expeditions sent out by India, Russia, France, Japan and Germany, and still more recent is the decipherment of the numerous literary finds in that area. In India we have followed the three scientific expeditions of Sir Aurel Stein to " Innermost Asia " and it was even more the account of his discoveries in the Khotan region in 1900-01, than the brief reconnaissance of Dr. Klementz, of the Russian Academy of Sciences, in Turfan in 1898, that drew the attention of continental savants to the survival of ancient art-relics and manuscript-remains in the sand-buried sites of Turkistan. Germany has since concentrated on the Turfan Basin, that scorching depression at the foot of the Tien Shan, and the Buddhist cave-temples between Turfan and Aksu. The first expedition, organized by the Ethnographic Museum of Berlin, under the leadership of Professor A. Grünwedel and Dr. Huth, brought back after a brief winter's season in 1902-03 art-remains of sufficient importance to justify three further expeditions, financed mainly by the Prussian Ministry

of Education and private donors in Germany. These operated in 1904-05, 1905-07, and 1913-14. The second of these was directed by Professor Grünwedel, a great authority on Buddhist iconography, while the first and third were under the expert guidance of Dr. von Le Coq, the distinguished orientalist.

The book under review is a translation of Dr. Le Coq's *Auf Hellas Spuren in Ost-Turkistan*, which appeared in Leipzig in 1926 and gives a brief, popular and readable account of the experiences of the second and third expeditions. It is written in attractive style, is well illustrated by excellent photographs of typical "finds" and is lightened by many humorous touches. When not burrowing underground or busy sawing out sections of wall covered with frescoes, Dr. Le Coq delights to jest. He is one of those lucky travellers into Central Asia who are not troubled by fleas in a Chinese serai. "Compared with lice," he writes, "fleas may be considered amongst the good things of Allah's creation." There are many amusing anecdotes. A priestly dignitary of Kara-khoja who thought the worthy doctor had lived apart from his wife in Germany long enough, offered his daughter in holy matrimony. It was only when he was told that the German Emperor would administer twenty-five with "the big stick" for such an offence, that the dignitary "took his leave with many expressions of pity and friendship." The "big stick" has a special meaning in Central Asia. Blood gushes forth at the first stroke, while twenty-five strokes are sufficient to kill a man.

But apart from the narrative of daily travel, this popular account is a very good introduction to this particular civilization. It will have been noticed that all four expeditions took place before the war, and therefore the author has had the opportunity of gathering together the results of the work of his scientific collaborators and of incorporating ideas from other foreign expeditions. He is accordingly in a position to give a concise and accurate historical sketch from the conquests of Alexander; he traces the four great fluctuations of humanity from west to east and from east to west along the Central Asian silk-routes, and shows how Buddhism and its art reached the nations of Chinese Turkistan from Bactria and spread to the westernmost provinces of China.

Perhaps the most interesting of his and Professor Grünwedel's discoveries is the light thrown on the lost religion of Manes, that extraordinary Persian teacher of the third century, who was subsequently crucified by the Persian king Bahram in A.D. 273. The first finds connected with the Manichæan cult were brought to light

by Professor Grünwedel and their true character first recognized by that distinguished orientalist, Professor F. W. K. Müller, of Berlin. Manichæism, though actually an independent religion, is now shown to have been sufficiently akin to Christianity and Buddhism for its adherents to pass as sectarians of either, and when they were not blinded by fanatical zeal, to live side by side with both Christians (Nestorians) and Buddhists. On the conquest of the Turfan country about A. D. 760 by the Uighurs, a Turkish people, we find the Uighur kings embracing Manichæism, while many of their people were converted to Christianity. Dr. Le Coq emphasizes that these three religions are of western origin and that the Sogdian writing, used by the Manichæans amongst other scripts, was also derived from a Semitic source.

The religious tolerance in Central Asia is all the more remarkable when it is realized how the Manichæans, through their own fanaticism, were persecuted and finally exterminated in the West, where their religion had spread to North Africa and South Europe. It is thanks to the conversion of the Uighur princes in a land as rainless as Egypt—or rather more so—that Dr. Le Coq attributes the preservation of so many priceless Manichæan texts. To give some idea of the labour involved in deciphering the literary finds from Chinese Turkistan, it is sufficient to add that they are written in seventeen different languages and in twenty-four scripts. The art-remains brought back by the successive German expeditions are accommodated and exhibited in the Ethnographic Museum at Berlin in an impressive and most excellent manner. The example thus set might well be followed by other countries, especially India, which have benefited by the “archæological proceeds” of the several Central Asian expeditions, following Sir Aurel Stein’s pioneer explorations of 1900-01.

There is also much of interest in Dr. Le Coq’s description of the Turfan depression to-day, but he is frankly not a geographer, and we already have a better geographical account and an accurate map, thanks to the visits of Sir Aurel Stein. And it would seem that the story of the doctor’s return journey across the Karakoram has suffered from his anxiety at the time for his sick companion, Captain Sherer, for whom he was hurrying on ahead for medical aid. There seems in fact to be some mistake in the compilation of this account. The Saser pass certainly can be terrible in bad weather, but we do not recognize the “terrible” Murghi, unless the spurs north of Murgo which form the Burtsa gorge, which may be difficult to negotiate when the pony-road is broken, are indicated. The only other pass hereabouts is the

exceptionally easy Chong-tash pass between Murgo and Saser Brangsa. Dr. Le Coq says that from Burtsa, which is not far south of the Depsang plains, "in eight and a half days we had crossed the terrible passes of Murghi and Saser, as well as the easier Karaul pass, and reached the Nubra valley." Without double-marching, the whole journey from the Depsang plains to Panamik can be traversed easily in six days. It seems ungenerous to criticize this minor point, for Dr. Le Coq not only reached Panamik, but he returned with medical aid back over the Saser pass to the relief of Captain Sherer.

There is however one point for criticism, and that is the absence of a readable map. The two sketch-maps are almost illegible and quite unintelligible to anyone who has not visited the ground or studied other maps. Some publishers seem to be past praying for in this matter, but perhaps we should be grateful to them when they publish translations of foreign books of interest. May we hope that the account of the fourth expedition, which has already appeared in German under the title of *Von Land und Leuten in Ost-Turkistan*, and which contains the fascinating history of the decipherment of the forgotten scripts, will find as sympathetic a translator and as enterprising a publisher.

KENNETH MASON.

CHINA TO CHELSEA: A MODERN PILGRIMAGE ALONG ANCIENT HIGHWAYS.—BY CAPTAIN DUNCAN MCCALLUM, M.C. *London: Ernest Benn, Ltd.*, 1930. $8\frac{3}{4} \times 5\frac{1}{2}$ inches; 284 pages; illustrations and maps; 21s.

SCORNING the greater speed, comfort and comparative cheapness of the facilities provided by Lord Inchcape, Captain and Mrs. McCallum decided to find their way home from North China, where they were stationed, overland as far as possible. Ordinary people regard the passage home as merely an irksome preliminary to the actual leave. The McCallums seem to have used all their leave on getting home. The result was an interesting if arduous journey, the details of which Captain McCallum has, fortunately for those who find serious travel literature more thrilling than Edgar Wallace, committed to paper and ink.

The original intention of these hardy travellers was to make the journey from Peking to Calais entirely overland, except for the ferry passage over the Sea of Marmora, that is to say, via Mongolia and Russian Turkistan to Meshed, thence by well-known routes through Persia, Iraq, Turkey and Europe. Civil war in China, as well as the

doubtful state of Soviet Turkistan, however, caused more prudent counsels to prevail and the McCallums drove to Tientsin, whence they embarked for Haiphong in French Indo-China. Thence they progressed, partly by road and partly by rail, to Singapore, where they took to the sea again for Calcutta. From Calcutta the road journey to the Dardanelles and thence to Calais, if not plain sailing, was at any rate successfully accomplished.

Written for the travel-lover rather than for the scientific geographer, *per se*, the book nevertheless brings out at least one important geographical truth, and that is, that where railways do not exist, intercommunication between points on the same land-mass, Eurasia for instance, is often easier by sea than by land. To the student of human nature the book stresses the qualities necessary for the successful accomplishment of such a journey : Enthusiasm to disregard discomfort ; Courage to face inevitable difficulties ; Determination to succeed at all cost. Co-operation between the members lightened the strain ; friends and ample funds smoothed the way. That the McCallums did succeed, in spite of mud, rain, snow, water, sand, rock and earthquakes, to say nothing of various forms of opposition, is a matter for pride on their part and congratulation on ours.

Captain McCallum is obviously an observant traveller with the gift of vivid description, while it is evident that his notes were written up *en route*, and not left to the tender mercies of a memory which might become blunted with the lapse of time. The historical part of his tale, moreover, for which the author makes due acknowledgment to Mr. J. D. C. Monfries, definitely places the book above the common run of travel books which are so frequently nothing but a glorified diary *cum* itinerary. In some ways it almost compares with "Eothen," but lest this should be thought too great a compliment, we will say that Captain McCallum's book is in the same class.

Having bestowed this well-merited praise, perhaps we may be permitted to notice what appear to be one or two minor flaws. The author claims that his description of Indo-China and its ancient temples and ruins is the first to be published in the English language. We think he is mistaken, for a long and brightly-illustrated article on the subject appeared some little time ago in the *American Geographic Magazine*. On page 197 he refers to a Sikh friend as a strict Hindu. Although Sikhism is an offshoot of Hinduism, a Sikh is hardly a Hindu and certainly not a strict Hindu. As well describe a Unitarian as a strict Christian. Another complaint : Why use the word "ochlesis" on page 17 ? Presumably it means "mob" or "crowd"

as it appears to be derived from the Greek *ochlos*. If this is the author's meaning, why not use plain English, or plain Scots, if he likes that better? On page 229 he describes a previous motor journey of his across the desert from Damascus to Baghdad in 1923 as a "pioneer" journey. This is hardly accurate, as the same route was traversed by Major Kenneth Mason with three other officers by car early in 1919. Finally a very small point: There is a reference on page 186 to the *Commissioner* of Waziristan. Surely he means the *Resident*? There are no Commissioners outside British India.

Two remarks, very interesting to those who know the East, deserve special comment. The first is the almost incredible one that no baksheesh is now expected or *accepted* in Turkey; the second is that a son of an ex-Sharif of Mecca is earning his living as a motor salesman in Turkey, representing an American firm.

The book is plentifully illustrated with some excellent photographs and has four very good maps which really illustrate the text. Furthermore, they open clear of the book so that the reader can refer to them without the nuisance of turning back. For this and for the general get-up of the book we sincerely congratulate the publishers, *Ernest Benn, Limited*. There is a complete index.

R. J. W.

FOUR MONTHS CAMPING IN THE HIMALAYAS.—By DR. W. G. N. VAN DER SLEEN. Translated by M. W. HOPER. *London: Philip Allan & Co., Ltd., 1929. 10×7½ inches; 213 pages; numerous illustrations; 21s.*

In the course of their wanderings in the Himalaya and beyond, many members of the Himalayan Club must, at times, have longed for a greater knowledge of geology and ornithology than happened to be theirs. Dr. Van der Sleen, in describing his short expeditions into the Himalaya from Simla, suffers from no such disability. Indeed one of the great charms of this fluently-written book is the simple manner in which the author makes use of his knowledge as a naturalist and geologist to paint the pictures of his daily travels. He hopes at some future date to publish the scientific results of his tour *in extenso*. We trust that it will be in the near future, and that as competent a translator and as enterprising a publisher as Mr. Hoper and Messrs. Philip Allan will co-operate in giving us the English version.

The four months are divided into two distinct parts. The first comprises the journey via Narkanda, the Sutlej, Bashahr, over Wangtu bridge to Chini Kanda, a climb on to a shoulder of Kailas,

and then back to Simla, the conclusion of this expedition being marred in a small degree by the arrival of the monsoon. The second part tells of a journey to Kulu via Rampur and back, during which the party was caught by the first winter snow. The author expresses even more surprise at this than on being caught by the rain previously. "And on a flat mountain top" he writes, "there is a basin in the rock clothed with high grass, an ideal spot for a nap, which we took full advantage of. And this, mind you, in the beginning of November at an elevation of 13,000 feet! Who could foresee that only four days later the place would lie three feet deep in snow?" Possibly Santoo, the English-speaking servant, also expressed surprise, but we doubt if the baggage coolies did.

Dr. Van de Sleen's appreciation of the beauty and grandeur of the scenery is very evident. The chapter on the Dance of the Gods and the funeral ceremony of the luckless daughter-in-law of the Rajah of Bashahr are vivid and interesting. But throughout the book it is the author's knowledge of nature that enhances the peculiar attraction of his descriptions. Of the hills near the Wangtu bridge he writes: "Everywhere the rock has crumbled away into channels and clefts, and evidence of former landslips is revealed by innumerable splits and fissures. In fact I was strongly impressed by the fact, confirmed at every turn by later observations, that this huge mountain-system is still alive, or rather that its active formative energy has not been quiescent for anything like so long a period as that of our Alps, for instance." When describing the climb to Chini he says: "A stiff climb brings us to the yellow rocks. It is as I thought: they are of grey granite gneiss covered all over with lichens, growing in the same orange and yellow patches and circles that we find on our own basalt slopes. They cover all the older fragments of rock and are the first signs of that encroachment which presently under the protective conditions of the atmosphere will make further plant life possible. Up here at tree-limit the lichens work in silence and yet they speak to us in clearest tones. 'Here is safety' they say. 'Here you may pitch your tents in peace. But yonder, where the lichens can find no foothold, where the weather-beaten crags are bald and cold and grey, is the rocky zone. And every change of temperature spells danger to life and limb'."

In most chapters there are delightful descriptions of bird-life and flowers, but we must not mar the readers' enjoyment by giving extracts. Modern photography has reached a high standard and some of the illustrations in this book are the products of an

exceptionally artistic mind. The picture of the temple at Paunda is typical and really lovely ; while the two plates, on pages 35 and 124, of the *Capparis* in full bloom are most attractive.

One or two errors or misprints may be noted. On pages 81 and 108 the height of Mont Blanc is stated to be 18,000 feet. Pin Parjal (p. 84) and Pir Panjal (p. 112) both probably intended for Leo Pargial, or more correctly, Rio Porgiul ; its highest peak is 22,170 feet above sea-level. There is no peak of 28,000 feet in this neighbourhood. *Omne padme hom* (p. 101) is not the usual transliteration of the Tibetan prayer.

Distinguished foreigners visit this gigantic and marvellous chain of mountains that encloses India on the north and write interesting books of their travels. One peculiarity applies to nearly all of these books. They seem to give us the impression that the writer is practically the only "explorer" who has been to the particular part of the Himalaya he describes. True, the gentle hill-man likes to please the white man as much as does his brother in the plains, and it is only human to be mildly elated when one is told that one is the only white man who has travelled to some particular spot. Few of us in the Himalayan Club can count ourselves as explorers, and fewer of us have, alas ! the gift or leisure to write up our travels. Yet one or other of us, or of those who spent their leave wandering among the Himalaya long before our Club existed, has generally been into the country "explored" in these modern books. The book under review but faintly echoes this note of "exploration" of a country known to many of us, but for all that it is most welcome for its charm.

Dr. Van der Sleen wonders if he will ever see the Himalaya again. We hope he will, and that he will push through the Himalaya and on beyond the Hindu Kush, to write again of his new experiences and to charm all lovers of nature among high mountains.

J. R. C. GANNON.

TRAILING THE GIANT PANDA.—BY THEODORE ROOSEVELT AND KERMIT ROOSEVELT. *New York : Charles Scribner's Sons, 1929. 8 $\frac{3}{4}$ × 5 $\frac{1}{2}$ inches ; 278 pages ; map and illustrations ; price 3.50 dollars.*

WHEN the Roosevelt brothers and their companion, Suydam Cutting, passed through Calcutta early in December 1928, they expressively remarked that the main object of their forthcoming expedition was "to knock the P out of Panda"! This animal, *Eluopus melanoleucus*, lives in the dense bamboo jungles of Szechuan,

and though discovered some sixty years ago by Père David, the French missionary, who obtained incomplete skins from the natives of Muping, it had never been killed, and it probably had never been seen alive, by a white man. According to the *Journal of the Bombay Natural History Society*, it is a representative of the *Procyonidæ*, of which the American racoons and our Himalayan Cat Bear are members. There is a skull and skin from Szechuan in the Royal Scottish Museum at Edinburgh, and a skin in the British Museum collection. Amongst others, General Pereira had hunted it in vain, and the Roosevelts started out with very slight hope of success.

The greater part of the book under review is devoted to this quest. As in their *East of the Sun and West of the Moon*, describing the expedition of these three musketeers to the Tien Shan, so in this, Kermit and Theodore write alternate chapters, while Suydam Cutting, who was by no means the least energetic of the party, judging from the narrative, performs the useful rôle of butt and foil. His pyjamas, his piebald mount "Mickus," his error when he nearly sat upon the baby on the floor, and several other little things he did to lighten monotony, are told good-humouredly, and go to show how useful a third party can be. There is in fact no feeling anywhere in the narrative that "Two's company, Three's none."

The "trail" led from Bhamo in Burma, through Tengueh and Talifu in Yunnan, past the 20,000-foot Mount Satseto in the great mountain loop of the Yangtse, and into the little kingdom of Muli in Szechuan, which we learn "is one of those small, only partially assimilated principalities that are found in Western China." The route then crossed the Litang and Yalung rivers through practically unknown country, past Mount Koonka, to Tatsienlu. About Koonka, Kermit remarks (p. 130): "The altitude of this mighty peak is unknown, but there are those who claim that it rises more than thirty thousand feet and is the highest in the world." It would be worth somebody's while to determine the altitude of this summit; but until it has been determined, it is a little rash and not a little unfair to Everest to enter the altitude 30,000 feet upon the map, as has been done on the one at the end of this volume, even though it is qualified in the text.

From Tatsienlu the panda-hunting begins in earnest. Hardships and disappointments are many, but in the narrative they are minimized. Yet, were it not that we have already glanced at the illustrations, we too would almost be in despair. At last success crowned the efforts of the hunters, when hope had almost been abandoned.

The Giant Panda is the size of a bear. Around its eyes are black rims which look like spectacles. Its ears and all four legs are black and a heavy black band stretches over its shoulders ; the rest of the body is white. A fine coloured frontispiece illustrates the animal. In an interesting appendix, its habits are described, and a brief record of other game to be obtained in the region is given. Besides the Giant Panda, or *Beishung* (white bear) as the natives call it, there are black and brown bear, which were however hibernating, Takin, Sambhur, Wapiti, Musk and Barking Deer, Burrhel, Serow and Ghoral. The expedition also obtained a fine group of the Golden Monkey for the Field Museum.

There is much of interest besides the "trailing." The chapters seem to have been written, or certainly roughed in outline, while on the march. We therefore get a very vivid picture of the various races, the habits of the people, and of their daily lives. Bandits seem to be as common as dacoits were in India before British rule, and the return journey through Lolo country was not unattended with danger. Possibly in no other country in the world are idols and gods treated with such scant veneration. Frequently they were found neglected and broken. And where else in the world is a god *punished* for not answering a prayer? "People ask god for something. Kill chicken for him. God not do it. *Break* his arm off." That should teach him to keep his ears open in future!

The whole book is most interesting. It is meant for the general public and not for the highbrow, and was published two months after Theodore Roosevelt's return from the expedition, a "hustle" we cannot compete with in India. The writers evidently enjoyed writing it as much as the reader will enjoy reading it. No surveying was done, and so the map at the end, which quaintly but capably illustrates the narrative, must not be taken too seriously. The zoographical appendix summarizes the scientific results.

There is one curious misprint. On page 104 we read: "Next morning we reluctantly crawled out of our eight mules and Suydam's horse." Why reluctantly?

KENNETH MASON.

BIG GAME SHOOTING IN THE INDIAN EMPIRE.—By C. H. STOCKLEY, D.S.O., O.B.E., M.C., F.R.G.S., F.Z.S. London: Constable & Co., 1928. $9\frac{1}{2} \times 6\frac{1}{4}$ inches; 210 pages; 18s.

THIS book fills a long-felt want among sportsmen and is a welcome addition to the literature on big game. The author's experience places

him in the front rank of present-day big game hunters and he is to be congratulated on producing such a delightfully interesting volume.

There are two parts. The first deals with all subjects connected with big game shooting, from the selection of a shooting-ground to the skinning and preserving of trophies, and is packed with good advice. Each locality is treated separately and the game to be found therein enumerated. Burrhel and Serow should, however, have been included under Kulu. The former are plentiful enough to deserve mention although the heads are not so large as those of Ladakh; Serow are still to be found in most of the wooded nullahs.

There is a slight error on page 34: "15 marches, 16 coolies at 6 annas" is Rs. 90 and not Rs. 240.

The chapter on rifles is not very clear or correct. The author sweeps aside, as unfit for the purpose, the .375 and .350 Magnums and ends by accusing them of having a higher trajectory than his chosen .318 W. R. Axite. This, of course, depends on what weight bullet he uses. If he uses the 180-grain bullet, the .375 Holland can still give the .318 about 2000 feet-secs.; but if he uses the 250-grain bullet the .318 does not come into the Magnum class at all and its trajectory cannot compete with those of the .375 Holland, .369 Purdey and .350 Rigby. Again the author states that he found he could do as good work in heavy jungle with a .280 Ross as with a heavier rifle, but this statement loses some of its conviction after his experience with the tiger (p. 173) where he admits the bullet was not heavy enough.

Part II is original in conception and execution and its like is not to be found outside Sterndale's *Mammalia*. This part deals with 54 species of Indian big game, giving their description, habitat and distribution and a wealth of other useful information. It is to the second part that most sportsmen will be attracted, for it provides reading of which they will never tire. For the tyro it is a textbook of profound knowledge and for the more experienced, an endless source of interest.

Both parts are profusely illustrated with excellent photographs which make the book an indispensable companion.

A. M. DAVID.

STERNDALE'S MAMMALIA OF INDIA.—BY FRANK FINN.
Calcutta: Thacker, Spink & Co., 1929. $7\frac{1}{2} \times 5\frac{1}{2}$ inches; 340 pages; numerous woodcuts; 10 rupees.

ROBERT ARMITAGE STERNDALE was the first naturalist to produce a comprehensive popular manual on Indian mammals. It has long

since been out of print, and this abridged and revised edition by Mr. Frank Finn, which, while maintaining much of Sterndale's material, has been brought up to date, is one that every outdoor man in India should have in his library, if he takes any interest in the wild creatures about him.

The book is compact and easy to carry about ; it is arranged scientifically and has a good index ; and there is a section on Reptiles by Mr. Finn himself which did not appear in Sterndale's *Mammalia*. The many illustrations, and the popular names printed in bold type make it very easy to spot the animal one is looking for. The description of each species is clear and to the point. Scientific and local names are given as well as distinctive habits, many of them still in Sterndale's own words ; one should therefore have no difficulty in identifying a Binturong or Pangolin, a Hangal or a Shou !

Himalayan mammals are there in force, and the habits of the great wild sheep and goats are well described, though perhaps one would have preferred a little more and later information about the *Ovis Karelini*, and the *Ovis Poli*. These however have their habitat beyond India, so we must not grumble. To show how thoroughly every Indian mammal is dealt with, it is sufficient to add that descriptions are given of no fewer than 13 species of Langur, and 29 of Squirrels and Flying Squirrels ; and yet the range of the book is wide enough to cover Elephants and Frogs, the Wild Ass and the Dugong. The picture of the last is nothing like the Mermaid of our dreams !

R. H. PHILLIMORE.

DAINRA.—A NOVEL BY "GANPAT" (MAJOR M. L. A. GOMPERTZ).

London : Hodder and Stoughton, 1929. $7\frac{1}{2} \times 5$ inches ; 317 pages ; 7s. 6d.

IN *Dainra*, "Ganpat" has infused an immense amount of "kick" into the ashes of two thousand years ago. The scene is laid in the little mountain state of Asmaka, a map of which appears as the frontispiece, and over which Queen Dainra rules with a cruelty hard to beat. Members of the Himalayan Club will be puzzled to identify Asmaka, for "Ganpat" has set a problem in topography which even the genius of Sir Aurel Stein could never solve. Let it suffice that it is somewhere along the mountain course of the Indus. The reader will not long be puzzled. He will soon be far too thrilled by the merciless intrigues of Dainra.

Against this beautiful woman, "who holds a fighting people in leash as no man ever held them," Leontas and Phidias, of Græco-Bactrian Bazira, Attos and Kakar, petty chiefs of the centre and the east, and Kodai and Lodran, both of the north, pit their wits; and the queen all but wins. These men are different from one another and all very much alive. "Ganpat" has very skilfully paired his allies; Leontas, whose life was sword and horse and hound, with Phidias, the straight cool thinker; Kodai, the energetic chieftain, with his vacillating brother Lodran; Starai, chief of the western gate, the sporting wrestler, with Larsho, the unsporting bowman; Lutqa, the Tatar amazon, with Astane, the cause of Dainra's jealousy and rage; even Dainra herself with her snow-leopard. Only Attos, the shifty, and Kakar, the diseased, play lone hands and lose.

All these essences frothed and bubbled in the Indus Kohistan for the space of a hectic year or two. Long odds, forced marches, amazing archery, loyalty, treachery, malice and other forms of uncharitableness all come into the day's work, and are the natural result of mingling such incompatible temperaments. "Ganpat" is rapidly becoming the Rider Haggard of our Indian hills.

KENNETH MASON.

CORRESPONDENCE.

"THE WRONG SHAPE."

To

The Editor,

The Himalayan Journal.

MY DEAR MASON,

In my review of Hayden's book on "Sport and Travel in the Highlands of Tibet," published in the first number of *The Himalayan Journal*, I referred to the Tsarong Shapé, mentioned in the book, as having been executed. The source of my information on this matter was one of the London dailies, which, however, seems to have mixed up the present Tsarong Shapé with his predecessor. I have just learnt from Col. Weir, Political Officer in Sikkim, that Hayden's friend is still alive. My regret at having repeated the mistake made by the London newspaper is overshadowed by my gratification that

such an enlightened officer should still be in the service of his country. I suggest that the mistake should be publicly corrected in the next number of the journal.

CALCUTTA,

3rd October, 1929.

Yours sincerely,

E. H. PASCOE.

GILGIT AND HUNZA RIVER FLOODS.

To

The Editor,

The Himalayan Journal.

DEAR SIR,

With reference to your paper on *Indus Floods and Shyok Glaciers* published in the 1929 Journal, I have collected the following notes while out on tour, which I trust may be of interest.

The Second Great Indus Flood, 1858. I do not think that there is room for any doubt as to the origin of this flood. There are old people still alive in Hunza who remember it.

They say that there used to be a small catchment area forming a lake on the top of the hill forming the right ridge of the Hunza valley, some nine miles above Baltit and about a mile below Atabad. The lake was called "Shaikalti Phari," and was opposite the place now shown on the map as Ganesar (really Ghammesar). The bank of the lake suddenly gave way and down came a tremendous mass of the hill-side into the Hunza valley, below, completely blocking the river to a height of many hundreds of feet. The river was blocked for nine months and a lake formed, stretching right back to the mouth of the Shingshal river and the Batura glacier. The old grey-beards of Hunza say that when the obstruction eventually gave way, the air remained misty for a week. Enormous damage was done to all cultivation near the river.

At the present day the remains of this obstruction are very noticeable—in fact, the stream has only cut a narrow passage through the debris, the track to Kashgar has to climb over the obstruction, and a very steep climb it is. Upstream of the obstruction the river, right back to Pasu, has only a gradual fall, and the usual huge boulders of the Hunza river are here buried under fine shingle. On each bank, some distance above the high-flood level, can be seen distinct traces of a sandy deposit, which might indicate the bed of the lake.

Gilgit River Flood, 1865. This is very probable. In the Karumbar branch of the Ishkuman river two well-known transverse glaciers periodically close the river and form lakes. One is the Karumbar glacier, shown on the Survey maps as some four miles above Bhort. The other glacier forms a lake at Sokhta Rabat considerably higher up the same river.

Hunza Valley Flood, 1873. I can find no evidence of a flood of any size in 1873. The people say that the Batura glacier has never caused a flood. It has been known to move across the river, but the water has soon found its way underneath or over the top.

Shingshal Valley Flood, 1884. The old Hunza records show that a lake in the Shingshal valley burst about 1884, and caused considerable damage to lands at Altit and Ganesh, near Baltit.

Shingshal Valley Flood, 1893. The present Mir of Hunza confirms that a flood from the Shingshal did damage to lands at Altit.

Ishkoman Valley Flood, 1893. In the summer of 1893, the Karumbar glacier, which had formed a barrier across the Karumbar river, suddenly gave way, precipitating a flood down the Gilgit valley. The water began to rise at 11-20 p.m. on 6th July, reached 23 feet above high-flood level at Gilgit, and began to subside at 3 a.m. on 7th July. A new bridge was under construction at Gilgit, just below the old one built by Aylmer. Both were washed away. These were pier bridges; later a suspension bridge was constructed, and this has remained.

Ishkoman Valley Flood, 1905. The Karumbar glacier was again responsible for a flood in 1905. The glacier broke about midnight on 17-18th June, and the flood arrived at Gilgit, 20 feet above high-flood level, at 8-30 a.m. No damage occurred below the junction with the Hunza river, but above Gilgit considerable damage was done to villages along the banks of the river.

Shingshal Valley Flood, 2nd August, 1905. The usual Shingshal valley lake, formed by the Khurdopin glacier blocking the upper Shingshal valley, caused a heavy flood in the summer of 1905. The bridge at Chalt was washed away, and a rise of thirty feet was recorded at Bunji. The Gilgit-Chalt road was extensively damaged.

Shingshal Valley Flood, 11-12th August, 1906. In 1905 the obstruction was not completely cleared, or the glacier again closed in across the Shingshal. A flood considerably higher than that of 1905 resulted on the night of 11-12th August, 1906. Askurdas, Tashot and Chamogah bridges were all washed away. At Chilas a

rise of 36 feet was recorded. At Chalt the river rose fifty feet above the normal summer level, and 25 feet above the flood of the previous year.

The Shingshal Valley in 1907. In 1907 a flood was again expected, and an elaborate system of bonfire warnings was arranged from the head of the Shingshal valley to Baltit. Actually however the water found its way over the top of the obstructing Khurdopin glacier, and, cutting a trough down gradually through the ice, dispersed quietly in eleven days.

Shingshal Valley Flood, 1927. The Mir of Hunza declares that there was no flood this year, nor is there any official record. If there was one, it must have been very small.

I am, Sir,

Yours faithfully,

GILGIT,

H. J. TODD,

8th May, 1929.

(Political Agent, Gilgit).

Note by Editor.

The remarks on page 22 of my paper in Volume I about the 1927 flood were from Captain Morris' lecture before the Royal Geographical Society (*G. J.*, Vol. LXXI, p. 525). Captain Morris has been good enough to supplement this from a verbatim extract from his diary.

" It seems that after our departure from Shingshal on 25th June one of the smaller glacier lakes at the head of the valley broke, thus allowing a large volume of water to escape down the valley. The rope-bridge at Shingshal was washed away and several of the more low-lying houses were partly submerged. It would appear that our caravan left the village just in time : had they halted another day, and had we failed to reach Misgar via the Ghujerab, a different story might have had to be chronicled. As it is we seem to have come in for a considerable amount of luck."

Captain Morris explains that at Shingshal they split their expedition into two, the lightly equipped party crossing to the Ghujerab, while the heavier kit and surplus equipment returned down the Shingshal. He learnt afterwards that for two or three days the water rose considerably in the main Hunza valley : but perhaps not enough for the Mir to describe the volume of water as a flood, having in view the earlier happenings. Captain Morris did not see the rise himself as he was at Misgar at the time, and Misgar is above the Shingshal junction.

In view of these facts it seems probable that the glacier barrier did not burst, the water probably reaching the top of the ice and cutting a trough comparatively

harmlessly through the glacier. It is also possible that the glacier was not cut through to its base and the lake only partly drained as happened in 1907.

SECULAR MOVEMENT OF HIMALAYAN GLACIERS.

To

*The Editor,
The Himalayan Journal.*

DEAR MAJOR MASON,

Many thanks for the most fascinating volume of the Himalayan Journal, and congratulations. Although at this moment my publisher is whipping me with scorpions, I must find time for suggesting briefly a most interesting problem.

It strikes me that historical information concerning the Shyok Dam and other dams and their consequent floods, extending through nearly a century, is so correct (owing to the economic importance of floods) that the material may possibly suffice for an attempt at synchronization of (1) the causes and effects within the Himalaya, with (2) glacial phenomena in Europe, especially in the Alps.

The documentary evidence to be interpreted consists of floods, landslides, glacier dams (or reliable advances of glaciers), earthquakes, and glacial advance in the Alps. Synchronization with Europe must be approached with caution, because glaciologists do not consider the evidence of a uniform Eurasian ice-age (not to speak of a world-wide one) as yet sufficient. All the more need for collecting data.

The last great advance in the Alps was about the middle of last century. From the state of the dead ice of the Turkistan glaciers, we are however inclined to believe that their last great advance may tally with the Alpine one. The trouble is that the Himalayan glacier floods may have nothing to do with a *general* advance, as I propose to show. I wonder if anyone has ever gleaned old evidence of a general advance from the tales or reports of surveyors, pilgrims, traders over the passes, monks, old Indian diplomatists, etc.?

The Shyok advance is abnormal. What is it due to? In Turkistan a certain type of glacier is very prevalent. It has no large basin, but only a tremendous corrie at its head. It is fed exclusively by ice-falls clinging to the walls of the corrie. Now in some of these

corries there may occur an exceptional crash bringing down enormous masses of ice all at once.

I believe the explanation of the Shyok dam must be sought for in the shape of the upper reaches of the glacier. I venture to guess that a big ice-field resting on inclined rocks, thirty to fifty feet thick and perhaps covering half a square mile, comes down every thirty years or thereabouts.

In the investigation which I propose, the normal rate of advance is an unknown quantity. I daresay very few Himalayan glaciers have been well timed so far.

The whole investigation will be somewhat of a jig-saw puzzle ; the fitting together of the pieces will not be easy. For landslides may be caused by earthquakes : Icefalls may be caused by earthquakes : Earthquakes may be caused by landslides, and ice-falls may cause *and be caused* by landslides caused by earthquakes. Who will tackle the tabulation of dates and data after this ?

Add to this the fact that even if normal speed of a glacier is known, the collapse of its hanging feeder will result in a much higher speed under such increased and enormous pressure. On the other hand one might tentatively arrive at the abnormal speed of the Shyok, when one starts from a landslide or earthquake about ten years back, or twenty as the case may be.

The whole question is eminently one for you people on the spot, who know conditions and can visualize them.

At the time of writing this the European papers report the bursting of the Shyok dam.

BREMEN, GERMANY,

23rd August, 1929.

Yours very sincerely,

W. R. RICKMERS.

Note by Editor.

My friend Mr. Rickmers doubtless knows of the observations made by officers of the Geological Survey of India, and published in their *Records*, Vol. 35. Since then various observations have been made by travellers all over the Himalaya. It is a vast task to collect and collate all these observations many of which are of very doubtful value, and investigate them. During the last twelve months I have done this for thirty-four glaciers in the Karakoram region, but I must confess that I have fought shy of attempting to attribute definite causes, such as landslides, earthquakes, etc., to what I consider the "accidental component" of glacier snout movement.

I have tried to show that snout movement is made up of four main components, secular, periodic, seasonal and accidental; and that in certain glaciers one of these components may greatly preponderate over the others. I have tried to define the conditions where secular movement will cloak periodic, and where periodic variation will prevent any visible secular movement. I have then classified those glaciers, of which we have sufficient details, into groups, viz., those (1) liable to show secular movement, (2) showing marked periodic movement, and (3) showing accidental movement.

Those in the first group seem to be either stationary or in very slight secular retreat, and only these could possibly show any synchronization with glaciers in Europe or elsewhere. Four of those in the second group seem to me to show a definite periodicity of advance, of approximately 45, 45, 48 and 55 years. But these are not "in time," and two of them within a few miles of each other were moving in opposite directions. Periodic movement is, in fact, affected by the actual configuration of the ground and the physical conditions of each glacier; and in certain compound glaciers it is possible for one side of a glacier snout to be advancing while the other retreats. Obviously no synchronization is here possible. Synchronization of the weather conditions in the névé area might be possible, but not at the snout, for though a glacier may be considered in some ways as a thermometer laid on the bosom of the earth to record by its "reading" at the snout the change of volume in its "bulb" or névé area, yet the reading really records the volume many years back owing to the time that the ice takes to reach the snout.

Seasonal variation is also not possible to synchronize, for it depends primarily on latitude. Accidental movements are haphazard, and as Rickmers says, in the nature of a jig-saw puzzle, which will cause someone many sleepless nights before it is solved.

I do not think that the advance of the Chong Kumdan glacier was abnormal. Elsewhere in this volume I have mentioned what I believe to be its periodicity, and the chart which accompanies my paper indicates, I believe, a periodicity (of 45 years) so regular, that we are now able to forecast almost the year when the next block will occur.

PRE-GHAL IN WAZIRISTAN.

To

The Editor,

The Himalayan Journal.

DEAR SIR,

In your notes (p. 105) of the last Journal, there is a reference to Captain W. R. Hay's visit to Pre-Ghal in September 1927, in which you remark that it would be interesting to know who were the officers who ascended the mountain during the expedition in 1881.

There is a detailed description in the official history of the expedition published by the Government Central Branch Press, Simla,

1884. The following is a detailed list of the officers who went to the summit :

CAPT. G. MARTIN (Survey)	CAPT. W. FRITH.
LIEUT. BLUNT, R.E.	MAJOR H. LUGARD.
LIEUT. SMITH, D.A.Q.M.G.	MAJOR T. O. UNDERWOOD.
LIEUT. HUGHES, 1st Punjab Cav.	CAPT. C. MANSEL.
LIEUT.-COL. A. ROSS.	LIEUT. E. INGLIS.
LIEUT.-COL. TONNOCHY.	LIEUT. W. NEWELL.
CAPT. A. H. CAMPBELL.	LIEUT. E. NODWELL.
CAPT. A. H. TURNER.	CAPT. C. P. EGERTON.
LIEUT. R. DAVIES.	LIEUT. F. W. EGERTON.
LIEUT. A. DANIELL.	LIEUT. F. W. HANCOCK.
LIEUT. A. ORMSTON.	CAPT. A. SHEPHERD.
SURGEON P. D. PANK.	LIEUT. C. VAUGHAN.
LIEUT.-COL. R. CLIFFORD.	MAJOR J. TROTTER.
LIEUT. A. EARDLEY-WILMOT.	CAPT. H. C. HALKETT.
CAPT. W. CAMPBELL.	LIEUT. E. DE BRATLE.
	SURGEON H. K. MACKAY.

The escort consisted of 140 rifles from each of the following regiments :

1st Sikh Inf. (now 1-12th F. F. Regiment.)
4th Sikh Inf. (now 4-12th „ „)
1st P. I. (now 1-13th F. F. Rifles.)
2nd P. I. (now 2-13th „)
4th P. I. (now 4-13th „)
6th P. I. (now 6-13th „)

This party made the ascent from Kaniguram, S. W. of the mountain, that is, from the opposite side to that used by Capt. Hay and myself. The description referred to is very detailed and most interesting.

Shuidar, the next highest mountain to Pre-Ghal, is now regularly ascended by parties of officers from Razmak. The first ascent from that place was made on the 14th April, 1927, by D. R. C. Boileau, Sergt. Hodson and myself of the 60th Rifles and A. J. B. Sinker and another of the 2nd Bn. 1st K. G. O. Gurkha Rifles.

Yours faithfully,

LAHORE,

ROGER NORTH, *Capt.*,

10th June, 1929.

(1st P. W. O. Sikhs, 12th F. F. Regt.)

THE GERMAN ATTACK ON KANGCHENJUNGA.

To

*The Editor,**The Himalayan Journal.*

DEAR SIR,

I have just received from Mr. E. O. Shebbeare a rough translation of Mr. Bauer's account of his party's climb on Kangchenjunga last autumn. I am full of admiration for this fine performance: the hardships the party endured, the grit and determination they showed in sticking to the route selected until success crowned their efforts, and the difficulties of competing with an unfamiliar language and unfamiliar conditions, which they seem to have so effectually surmounted, can be read between the lines of a modest account, and I consider that the party is to be congratulated on a very gallant attempt.

As the attempt is to be repeated this spring by another party, I have tried to analyse briefly the results of last autumn's climb, to compare it with the problem of Mount Everest, and to assess the chances of success. If you consider that this analysis would be of interest to readers of the *Journal*, you are of course welcome to publish it.

Exclusive of false starts it took the party just under a month from the foot of the ridge (17,060 feet) to Camp X at 23,290 feet. This includes the establishment of Camp X for six sahibs and four porters equipped "for the fight for the eight thousands." (The meaning of this expression is not quite clear to me. 8000 metres = 26,600 odd feet = 1500 feet below the summit, so I am not certain if they were equipped for the whole distance to the top). This represented a climb of 6230 feet.

Compare Mt. Everest: In 1924 we estimated to establish a similar party (equipped to lay out one more camp and reach the top) at Camp V (25,000 feet) in 15 days from the Base Camp (16,500 feet). This represented a climb of 8500 feet.

We failed: but that this was not an unreasonable estimate is proved by the fact that we established Camp V in 1922 (including a four-day reconnaissance of the East Rongbuk glacier—up and back again) with four sahibs in 19 days from first leaving the Base Camp, largely over an unknown route.

Camp V on Mount Everest was 4000 feet from the top—an easy rock climb.

Camp X on Kangchenjunga was 5000 feet from the top, and, judging from what Mr. Bauer says, the condition of the snow even at this height necessitated “stamping a track.”

Now the difficulties imposed by altitude only begin to be really serious from about 24,000 or 25,000 feet onwards, both as regards condition of the snow and rarity of the air.

Next consider the time available on Kangchenjunga.

Mr. Bauer's party started presumably in the tail of the monsoon (26th August), and got badly caught high up on the mountain by the first winter snowfall on 3rd October,—after five and a half weeks. A party trying it in the spring can hardly kick off from the foot of the mountain until 15th April on account of the spring cold; the monsoon is due to arrive by 21st May (I am writing from memory)—again five and a half weeks.

On Everest we reckoned on a season of from four to six weeks, i.e., from 1st May to the arrival of the monsoon on the north face of the mountain—any time between 1st and 15th June. The penalty for being caught high on Everest in soft new snow is the danger of avalanches on only about 1500 feet of descent from the North Col. On Kangchenjunga there must be thousands of feet of such dangers—as Mr. Bauer found.

Events may well prove me wrong: but on the face of it, Kangchenjunga appears to me a more formidable and more dangerous proposition than Mount Everest.

QUETTA,

5th March, 1930.

I remain, Sir,

Yours faithfully,

E. F. NORTON.

CLUB PROCEEDINGS.

THE Annual General Meeting of the HIMALAYAN CLUB was held in His Excellency the Commander-in-Chief's room at New Delhi on Monday the 24th February, 1930, at 9-30 a.m. The President, Field-Marshal Sir William Birdwood, *Bart.*, took the chair.

The Honorary Secretary (Mr. G. Mackworth Young) read his report on the work of the Club in the past year, which is printed below. The Club accounts for 1929 were presented and confirmed. The Auditor observed that the finances of the Club were in a flourishing condition. The Officers, Members of the Committee, and additional Members of the Balloting Committee were elected for the year 1930, and Mr. J. Reid, Manager of the Chartered Bank, Amritsar, was appointed Auditor.

REPORT ON THE WORK OF THE CLUB IN THE YEAR 1929.

By the Honorary Secretary.

Membership.—The membership of the Club at the time of the last Annual Report was 250. It has since risen to 302. During the year 1929, 62 new members were elected, and there are nearly 20 proposals awaiting the next election which will be held shortly. There have been 7 resignations of membership.

We have to record the death of one of the most distinguished of our members, Colonel Sir Thomas Holdich, a Founder member of the Club and a past President of the Royal Geographical Society. Sir Thomas Holdich was in his 87th year, and it is more than 30 years since he retired from service in India. To few of us therefore was he known otherwise than by name : but his is one of the greatest names in the history of Himalayan and Frontier exploration and research, and it is fitting that a tribute should be paid to his memory in this Report. A full obituary notice will appear in the forthcoming number of the *Himalayan Journal*.

The "Himalayan Journal."—During the year, we have issued the first volume of our *Himalayan Journal*. This has been received very well not only in this country but in Europe and America ; and we

have to thank many contemporary clubs and societies for their flattering reviews. We now exchange our Journal for the various publications of 31 such institutions, interested in our activities. Some twenty other public and official libraries have asked us to place them on our Free list. Our Honorary Editor desires me to thank those who have assisted him in making the first Journal a success, particularly our publishers, Messrs. Thacker, Spink & Co., of Calcutta : and this also I am glad to do. But I need hardly remind you that the greatest measure of thanks for the extraordinary success of the first volume is due to Major Mason himself.

Library.—The library has made good progress during the year. We have had many interesting and valuable books presented by members and others, and we have to thank Messrs. Thacker, Spink and the proprietors of *The Statesman* for several books which have been reviewed by club members and others. We have also to thank Messrs. Ernest Benn, and Messrs. Philip Allan who have let us have books of Himalayan interest for review. We hope that other publishers in England will follow their example.

One hundred and nineteen books were purchased by the librarian during the year, and our total number of books now in the library in Simla is 298 of which 155 have been presented and 143 purchased. A sum of £90 altogether has been spent on books and a further sum of Rs. 200 spent on bookshelves, catalogue and other essentials, since the library was started.

Issues of books have not been many, amounting to 44 from the Club library, 4 from U.S.I., 3 from Army Headquarters and 1 from the Survey library at Dehra Dun. It is hoped that when members receive copies of the new catalogue they will make more use of the library ; a list of the books added during the year will be given in the next Journal.

Captain A. E. Armitage of the General Staff Branch, Army Headquarters, Simla, has kindly promised to take over the duties of librarian when Colonel Phillimore is transferred from Simla in March, and has accordingly been appointed by the Committee to the post of Honorary Librarian with effect from then. I am sure that you will desire me to express the thanks of the Club to Colonel Phillimore for the enthusiasm and the very considerable amount of hard work that he has devoted to the inauguration of the Club Library, which owes its excellent start entirely to his efforts.

We are considering an offer of the Calcutta Sub-Committee to present the books in their possession to the Library at Simla.

Photography.—It was unfortunately not possible to arrange a Photographic Exhibition during 1929, but we hope to make arrangements to have one in Simla during September of this year. Many members must have in their possession photographs of out-of-the-way parts of the Himalaya and I venture to repeat an appeal which has already been made for copies for the Club collection. We hope in the course of time to build up a really complete collection of Himalayan photographs, but unless every member who can is willing to take a share in this work, the collection can never be fully representative. I hope that no member will be deterred from sending any copies of his pictures by a feeling that his work may not be up to the required standard. We shall welcome any contributions of this kind. A number of photographs and one picture have been presented to the Club during the past year. A list of these will be published in the Journal. I should like to draw attention to the fact that the services of the Club's correspondent for photography, Captain C. J. Morris, 3rd Q.A.O. Gurkha Rifles, Lansdowne, are available to any member who desires to make use of them. Captain Morris has kindly undertaken to advise on apparatus for Himalayan Photography and to answer any other technical enquiries.

Expeditions in 1929.—During the past year our members have been active in the Himalaya. Members resident in India on duty naturally try to combine their travels with that duty, while members from abroad come to the Himalaya for their holidays.

Among those who have been fortunate enough to combine their duties with Himalayan travels are Messrs. Wakefield, Gunn, Ludlow, Todd and Burn. Wakefield went to Western Tibet, and following various trade routes, visited Gangtok, Daba, Gyanema, Taklakot, Lake Rakastal and the famous monastery of Totling before returning to Simla by the Shipki pass.

The Chong Kundan glacier dam in the Upper Shyok burst, as you know, at 5 a.m. on the 15th August. Two of our members, Messrs. J. P. Gunn and F. Ludlow, who had been deputed by the Punjab Government to investigate the dam and the lake impounded by it, were actually examining the ice from the lake on the upstream side on the 12th August, three days before it broke. Mr. Todd, the Political Agent of Gilgit, was crossing Partab Pul near Bunji when the flood came down. We have received very full and interesting reports on this flood which are being summarized in the Journal. Mr. Todd has also been an active traveller in his Agency in other directions.

During the summer Lieut. Burn completed the detailed survey of Chitral, and with Captain Culverwell, another member, made an attempt on Istor-o-Nal, a peak of 24,271 feet, immediately north of the great peak of Chitral, Tirich Mir. The climb, though unsuccessful, formed a most useful reconnaissance and has paved the way for others. There have been a number of minor journeys, mainly for purposes of sport, but occasionally to study natural history, undertaken by members on short leave.

Of those members who have come out from Europe and America, I will mention first of all the Italian expedition of H. R. H. the Duke of Spoleto. A detachment of climbers succeeded in crossing the Muztagh pass (crossed from the north by Sir Francis Younghusband in 1887) and travelled up the Shaksgam valley to the Kyagar glacier. Details have not yet reached us, beyond those that have already appeared in the press.

Mr. and Mrs. Visser, the Dutch explorers, are still away on their third Karakoram expedition. They discovered and explored the great tributary glaciers of the Lower Siachen and Upper Nubra, the western tributaries of the upper Shyok, and the head waters of the Chip-Chap. After exploring the "Khushku Maidan" by the Karatagh pass they crossed into Chinese Turkistan and we last heard of them spending Christmas at Kashgar, with three or four other members of the Club. Khan Sahib Afraz Gul, who is joining the Club, surveyed all the ground covered by the expedition up to the frontier, and then returned.

Lieut-Colonel Reginald Schomberg after two years' travel and exploration in the Tien Shan, returned towards the end of 1920. We have just received a brief summary of his journeys, but we hope for a more detailed account later.

Far away, to the east of Burma, the Roosevelts had a most successful expedition on behalf of the Field Museum of Chicago, and were fortunate to obtain the first complete specimen of the Giant Panda, the "Spectacled Bear" of the dense bamboo forests of Szechwan. Another member, Kingdon Ward, out in the same direction, was less fortunate and was laid low by fever and unable to carry out his whole programme.

In Sikkin a party of German climbers from Munich, under Paul Bauer, made a most gallant attempt to climb Kangchenjunga by the eastern arête. Though they are not members of our Club, we took the greatest interest in their Expedition, and two of our members, Lieut-Colonel Tobin and Mr. Shebbeare accompanied the

party to the base camp, and were of the utmost assistance to the expedition. The attempt was made during the monsoon, and after desperate hardships and great perseverance the party was forced to retire by foul weather, after attaining a height of over 24,000 feet. After such a magnificent effort we all hope that Herr Bauer will return and lead a party to the summit.

While on the subject of Kangchenjunga, I should perhaps allude to the fate of Edgar Francis Farmer, an American, who set out *alone* to climb the peak, after having concealed his intention from everyone capable of deterring him. Farmer's coolies, experienced Everest men, were insufficiently equipped, and he himself inexperienced in climbing. The attempt ended in disaster, Farmer insisting on going on alone when his ill-shod porters could go no further. He was never seen again. Our local Secretary at Darjeeling, Colonel Tobin, and Mr. Laden La made a very thorough investigation and issued a full report to the American Consulate General at Calcutta, and offered to form a search party. But there was never any hope of Farmer being found alive, and the project was not carried out.

Our eastern members are gradually collecting a supply of tents and mountaineering equipment. The secretaries at Darjeeling and Calcutta are anxious to record the names of members who will be available for any expeditions this year or next, and who would like to be put in touch with others, similarly inclined. The difficulty in India is for one official to arrange his dates to suit those of another, and our Eastern local Secretaries are willing to try and put members in touch with one another. I should like to suggest that the same course of action should be followed by other local Secretaries.

One of our members returning from an expedition to Kulu and Lahul by the Basleo Pass on the Banjar-Rampur route reported that the road had fallen into such bad repair that he had the utmost difficulty in getting along. I am glad to say that the Punjab Public Works are taking over this route from the local District Board and hope to be able to allot funds soon for its improvement.

Botany.—The following is the report of Mr. Coventry, the Club's Technical Correspondent for Botany for the past year :—

A few enquiries were made for the names of plants from outside Kashmir, but quite a large number of enquiries of the same nature were made by visitors to Kashmir. Several letters were received from England asking for information as to how seeds and bulbs of some of the Alpine plants could be obtained. Apart from replying to correspondence of the above nature, the work of collecting and

naming specimens of the Kashmir plants was continued, and several specimens were sent to Kew for verification of their names. Over a hundred coloured photographs of specimens of plants were taken. A third volume of " Wild Flowers of Kashmir " was sent to the Press, and its publication is expected about April or May 1930.

Conclusion.—In conclusion, I should like to mention the services of two people who have earned our gratitude in no small degree during the past year. Major-General Muspratt took over the work of Honorary Treasurer last autumn : and, though he is probably the hardest-worked officer of Army Headquarters, not only disposed of all current business, but has collected a great number of outstanding subscriptions, and enabled us to form an accurate estimate of our true financial position. Mrs. Rubie, a member of the clerical staff of the Army Department, has been acting as my assistant in Himalayan Club matters since I took over last March, and has done a great deal of good work for us, particularly while I was on leave during the autumn, when she dealt with the correspondence single-handed.

CALCUTTA LOCAL DINNERS.

TWO local dinners were held by members of the Himalayan Club at Calcutta during the year. It is hoped to hold more of these in future in order to enable members to exchange views and arrange expeditions into the mountains.

At the dinner at the United Service Club on 23rd October the following members were present : Messrs. J. H. Blinko, C. R. Cooke, L. R. Fawcus, G. B. Gourlay, J. S. Hannah, Dr. A. M. Heron, Messrs. R. Y. Jarvis, J. Latimer, F. D. Lonergan, N. Macleod, E. H. Marshall, A. A. Marr, Major Kenneth Mason, Sir Edwin Pascoe (in the chair), Messrs. N. A. Tombazi, J. B. C. Rankine.

At the suggestion of Sir Edwin Pascoe it was decided to invite the members of the German Kangchenjunga Expedition to a dinner on their return and a telegraphic invitation was sent through Col. J. L. R. Weir, the Political Officer, Sikkim, to Herr Paul Bauer, the leader. The only date that could be arranged was 30th October, on which Sir Edwin Pascoe was unfortunately unable to attend.

The following members of the expedition were present : Herr Paul Bauer, Dr. E. Allwein, Herren P. Aufschnaiter, J. Brenner, W. Fendt, K. von Kraus and A. Thoarnes. Other guests included :

Dr. W. A. K. Christie, Dr. O. Eberl, Messrs. J. Van Manan, W. G. Fahrenholtz and W. Bredenkenp. Members of the Club present were Messer. J. M. Bottomley, C. R. Cooke, L. R. Fawcus, G. B. Gourlay, J. R. Hannah, R. Y. Jarvis, J. Latimer, N. Macleod, A. A. Marr, Major Kenneth Mason (in the chair), Mr. Arthur Moore, Capt. H. M. de V. Moss, Messrs. H. Newman, J. B. C. Rankine, R. A. K. Sangster, Dr. C. S. Strickland, Mr. N. A. Tombazi and Capt. G. E. Vosper.

After proposing the toasts of H. M. the King-Emperor and of the President of the Reich, Herr Von Hindenburg, the Chairman welcomed the expedition in the following words :—

There is one great attribute possessed by the Himalaya. There is room for all the climbers of all the nations of all the world. We are welcoming back to-night Herr Bauer's party of Bavarian mountaineers from Kangchenjunga. They require little introduction to members of the Himalayan Club for we have followed them closely in the pages of the *Statesman* during the last two or three months. It was Mr. Rickmers, the veteran mountaineer and member of our own Alpine Club at home, who first wrote to us to say that Herr Bauer was coming out to India and to ask us to help him on his way. Rickmers, who is a Heligolander, chaffingly alluded to them as "Some fine specimens of our wild tribe of Bavarians." Well, Gentlemen, here are the wild tribesmen!

Everest, the highest mountain, has been assaulted three times. K², the second highest, has been assaulted once. And now Kangchenjunga has been attacked for the first time in earnest. It almost fell to that attack. We are almost justified in saying that it would have fallen, but for foul weather when all the hard work had been accomplished.

Let me briefly give you the details. After passing up the Tista valley and hacking a way through the dripping rhododendron jungles of the Zemu Chu, a camp was established at 17,000 feet, on 28th August, near the head of the Zemu glacier (Camp VI). The Germans then reconnoitred several approaches to the great mountain and decided to attack the eastern arête. In a few days they ascended almost to the summit of this arête and pitched Camp VII immediately below the crest. But three days' heavy snow lasting from 8th to 10th September, forced them back to their base.

Starting again on the 14th, they once more hacked a way to the arête, and after four days formed Camp VIII at the top. Eight strenuous days followed, the party cutting almost every step through the cornices, up the great ice-walls, and over the maze of ice-gendarmes, which had to be climbed, since it was almost always impossible to traverse below them owing to the steep flutings of the avalanche tracks. The ice-staircase cut along the arête was made passable for the porters, each of whom was led over the difficult spots by a German. Sixteen days after the second assault began, Camp X was pitched above the last gendarme at a height of 23,400 feet, and a party of six Germans and four porters were concentrated there for the final climb.

From here the summit was in full view, the route to it leading straight along the arête at a comparatively gentle angle of thirty degrees to an outlier, at

about 26,000 feet, close to the northern arête. Then after a short descent of about 200 feet a steady but apparently easy rock climb led to the summit.

But Kangchenjunga, like Everest, has weapons in her armoury, which, if she chooses to use them, render her invincible. On 4th October she brought out all these weapons—a bitter wind, a blizzard and intense cold. With these reserves she fought the climbers for four whole days and drove back two assaults, during which a height of 24,450 feet was attained. On the 8th the order was reluctantly given to retreat. It would have been folly to remain on that ridge cut off from the base. It is difficult to conceive the difficulties of descent. On the hard ice every step had to be re-cut, for the sake of the porters, and in the soft new snow, the porters and Germans, all heavily laden, sank almost to their shoulders. One party lost its equipment in an avalanche and had to bivouac in the snow. This resulted in one member being badly frost-bitten, while another was smitten with snow-blindness.

Gentlemen, I have given you this brief account, partly because Herr Bauer and his companions are too modest to do so, and partly because you will see presently some of the photographs on the screen. Though they have not succeeded in attaining the summit, they have, I think, shown that the summit is attainable. Kangchenjunga was forced to bring out all her reserves—and shall we say, adopt unfair means?—sure sign of the desperate straits to which she was reduced!

Herr Bauer! The Himalayan Club is a young club, the youngest mountain club, I believe, in the world. It has already been our privilege to meet and welcome to India mountaineers from Italy, Holland and America, and I have for several years been in touch with your compatriot, Dr. Emil Trinkler. I think we may, as mountaineers, claim that the thing lesser and lower men call “the Spirit of Locarno” was known to us long before it reached the valleys and the plains.

Though some of you have tackled the heights of the Caucasus, I believe I am right in saying that, with the exception of Dr. Allwein, who was one of Rickmers’ expedition to the Alai Pamirs last year, and one of the party to reach the summit of the mountain we still prefer to call Peak Kaufmann, 23,380 feet above the sea, none of you have ever climbed east of Suez before. May I, on behalf of the Himalayan Club, scattered all over India and abroad, offer you our very warmest congratulations on the success you have achieved.

We hope that you will come back and make another assault on Kangchenjunga, and that if our club has not stolen a march on you, you, Herr Bauer, will lead the first party to the summit. One thing I can vouch for: you have left behind you in Sikkim a reputation for courage and endurance that will long be remembered. And I feel confident that, when you return, the porters who went with you on this occasion will clamour to go again. This is no idle compliment, and I will conclude by reading a telegram received this afternoon from Colonel Weir, the Political Officer in Sikkim. It runs as follows: “I will be glad if you will convey at the dinner to-night at the Himalayan Club my greetings and best wishes for future to German Kangchenjunga Expedition on their departure. They will always be welcome in Sikkim and it is hoped that success will crown another venture.”

Gentlemen! To the members of the German Kangchenjunga Expedition, and to our other guests this evening!

HERR PAUL BAUER, leader of the expedition, replied :

I have to thank first of all Major Mason for giving you a summary of our expedition, which he so kindly described as a full success ; though I may be permitted to say that I do not thoroughly agree with him regarding this statement. But since we were not asked to this dinner for the purpose of arguing with each other, I wish to confine myself to adding a few words with regard to the help granted to us by the Himalayan Club and, in a more remote sense, by those who have been exploring the Himalaya in the past. Whatever we may have accomplished is certainly not only to our own credit. We could not have done it without the pioneer work of Freshfield and Kellas, and without the experience gained by those Britishers who tried to climb Mount Everest. Only standing on their shoulders were we able to reach the altitude we did. I cannot let pass the present opportunity without paying my homage to those gallant men who sacrificed their lives during their gallant attempt on Mount Everest : Kellas, Mallory and Irvine. They will always live in the memory of those who try to follow in their foot-prints. We believe them to have accomplished what others tried, though they were not allowed to return and enjoy their triumph. We, the German expedition, were dependent on aid from your countrymen not only indirectly in this scientific and technical sense, but also in a very direct manner. Without the assistance granted to us by the Indian authorities and the Himalayan Club, we should have been helpless in a country the particular difficulties of which were utterly unknown to us in practice, though we believed we had learnt something about them from books. We could not have mastered the difficulties of approach, nor could we have selected the porters and servants whom we required for our purpose, without the never-failing help and advice on the part of several members of the Himalayan Club. I have to thank them most sincerely for everything they were kind enough to do for us ; and if I may I would express a heartfelt hope that Kangchenjunga will one day be mastered through the co-operation of the Himalayan and the German-Austrian Alpine Clubs.

I feel it is a duty on my part to ask you now to drink to the honour of those who have done gallant pioneer work in the Himalaya in bygone days !

DR. O. EBERL, the German Vice-Consul, also replied :—

MR. CHAIRMAN AND GENTLEMEN,

I WELCOME the opportunity which this reception of my fellow-countrymen gives me of associating myself with Herr Bauer in what he has said of the sympathy and very practical aid which was afforded the expedition at all times by the Himalayan Club and its members. The most striking and welcome feature of this aid was the granting of it almost before the expedition had time to ask for it ! Already in Calcutta they were spontaneously given every possible help and information by members of the Club, and in Darjeeling they found everything practically ready at the time of their arrival. The best porters available, those of the Mount Everest expeditions, had been collected, everything else was arranged, and Herr Bauer had only to put the last touches to this excellent work of preparation. Beyond that, two Darjeeling members of the Club accompanied the expedition on their way up to those icy regions, which gave the expedition the privilege

not only of enjoying their pleasant company, but also of profiting by their most valuable experience. So it is not too much to say that the Himalayan Club acted as a kind of Providence to the members of the expedition, who take away with them the recollections of a spirit of helpfulness and comradeship, which, as we have seen, does not always lead to the summit of Kangchenjunga, but certainly leads to mutual understanding and friendship. I am sure it will be felt everywhere in my country that the English friends of the expedition, and particularly those of the Himalayan Club, have deserved a full share of the recognition for what has been accomplished, and that nothing could have been done without their never-failing assistance.

May I add that I am charged to convey from my chief, Count Bassewitz, the Consul-General, his sincere appreciation of the kindness shown to the expedition, kindness which now, as in the old days before the black clouds of misunderstanding engulfed us all, is a sufficient testimony to the ability of our two races to live together in amity at work and in play.

I should like to ask my countrymen to rise and with me to raise their glasses to the prosperity of the Himalayan Club, and to its members, good fortune to all !

After dinner and the speeches had been concluded, the company adjourned to the drawing room, where Herr Bauer explained the various features of the climb and illustrated his route by means of Freshfield's map and photographs taken on the expedition. These were thrown on the screen by means of a Zeiss Epidiascope kindly lent for the purpose by the Agents of the firm of Zeiss.

G. B. G.

CLUB NOTICES.

I. APPOINTMENTS.

The following members have agreed to act as Local Secretaries, Correspondents, Assistant Editors, etc.

Local Secretaries.

Kashmir	..	..	Dr. E. F. Neve, F.R.C.S. (Edin.), Mission Hospital, Srinagar, Kashmir.
Chamba	..	..	Dr. J. Hutchinson, Chamba, <i>via</i> Dalhousie, Punjab.
Simla	..	..	G. Worsley, Esq., "Walsingham," Simla.
Darjeeling	..	..	Lt.-Colonel H. W. Tobin, D.S.O., O.B.E., "The Glen," Darjeeling.
Calcutta	..	..	G. B. Gourlay, Esq., M.C., 10, Clive Row, Calcutta.

Local Correspondents.

Lahore	..	..	H. M. Glover, Esq., Forest Office, Lahore.
London	..	..	Lt.-Colonel E. L. Strutt, C.B.E., D.S.O., 12, Somers Place, Hyde Park, London, W.2.
Meerut	..	..	Lt.-Colonel G. K. Gregson, D.S.O., R.A., 28th Field Brigade, Meerut.
Peshawar	..	..	Lt.-Colonel H. L. Haughton, C.I.E., Commanding 4th-11th Sikhs, Peshawar.
Quetta	..	..	Lt.-Colonel E. F. Norton, D.S.O., M.C., Staff College, Quetta.
Murree and the Galis	..	..	Lt.-Colonel C. G. Lewis, O.B.E., R.E., Survey of India, Murree.
Waziristan	..	..	Major-General, R. C. Wilson, D.S.O., M.C., Commander, Wana Brigade, Wana, South Waziristan.
Switzerland	..	..	H. F. Montagnier, Esq., Chalet Beau Reveil, Champéry, Valais.

Scientific and Technical Correspondents.

Archæology	..	..	Sir Aurel Stein, K.C.I.E., Ph.D., D. Litt., D.Sc., C/o Postmaster, Srinagar, Kashmir.
Botany	..	..	B. O. Coventry, Esq., Srinagar, Kashmir.
Entomology	..	..	Brigadier W. H. Evans, C.I.E., D.S.O., Headquarters, Western Command, Quetta.
Fishing and Shooting	..	..	Lt.-Colonel H. G. Martin, D.S.O., O.B.E., Staff College, Quetta.
Folklore	..	..	H. W. Emerson, Esq., C.I.E., C.B.E., I.C.S., Chief Secretary, Punjab Government, Lahore and Simla.
Geodesy and Geophysics	..	..	Dr. J. de Graaff Hunter, Sc.D., M.A., Director, Geodetic Branch, Survey of India, Dehra Dun.
Geology and Glaciology	..	..	Dr. L. L. Fermor, O.B.E., A.R.S.M., D.Sc., Director of Geological Survey of India Calcutta.
Meteorology	..	..	Dr. C. W. B. Normand, D.Sc., Director- General of Observatories, Poona.

Ornithology	..	H. Whistler, Esq., Caldbec House, Battle Sussex, England.
Photography	..	Captain C. J. Morris, 3rd Q.A.O. Gurkha Rifles, Lansdowne, U.P.
Survey and Maps	..	Colonel R. H. Phillimore, D.S.O., Director, Map Publication, 13 Wood Street, Calcutta.
Zoology	..	Lt.-Colonel C. H. Stockley, D.S.O., O.B.E., M.C., 3-14th Punjab Regiment, Fort Sandeman, Baluchistan.

Honorary Assistant Editors.

<i>Himalayan Journal</i>	..	Lieut. J. B. P. Angwin, R.E., Survey of India, Shillong.
<i>The Pamirs and Kun Lun</i>		C. P. Skrine, Esq., I.C.S., H. B. M.'s Consul-General for Sistan and Kain, Nasratabad, (via Duzdap); and Lieut. G. Sherriff, R.A., Vice-Consul, Kashgar (via Gilgit).
<i>Gilgit Agency</i>	..	H. J. Todd, Esq., Political Agent, Gilgit.
<i>Baltistan, Nubra, Ladakh and Zaskar</i>		Lt.-Colonel M. L. A. Gompertz, 3-10th Baluch Regiment, Wana, N.W.F.P.
<i>Kashmir including the Kishanganga, the Lolab, the Sind and the Lidar</i>		J. Kelly, Esq., M.A., Aitchison College, Lahore; and Major K. Hadow, M.C., Srinagar, Kashmir.
<i>Murree and the Galis</i>	..	Lt.-Colonel C. G. Lewis, O.B.E., R.E., Survey of India, Murree.
<i>Punch, Jammu, and Udhampur (Kishtwar)</i>		H. L. Wright, Esq., Chief Conservator of Forests, Jammu and Kashmir State, P.O. Jammu, N. W. Rly.; and J. Kelly, Esq., M.A., Aitchison College, Lahore.
<i>Chamba</i>	..	Dr. J. Hutchison, Chamba, via Dalhousie, Punjab.
<i>Kulu</i>		Captain D. G. Lowndes, 2-18th Royal Garhwal Rifles, Peshawar.
<i>Lahul and Spiti</i>		Captain J. S. Lethbridge, R.E., 1st Sappers and Miners, Rawalpindi.
<i>Dharmasala Hills</i>		Captain J. W. Rundall, 1-1st K.G.O. Gurkha Rifles, att'd. 3rd Assam Rifles, Kohima, Naga Hills, Assam.

<i>Bashahr</i>	..	..	R. MacLagan Gorrie, Esq., I.F.S., P.O. Nichar, Simla District.
<i>Simla District</i>	..	..	G. Worsley, Esq., "Walsingham," Simla.
<i>Mandi State</i>	..	..	H. L. Wright, Esq., Chief Conservator, Forests, Jammu and Kashmir State, P.O. Jammu, N. W. Rly.
<i>Everest Group</i>	..	..	Captain J. G. Bruce, M.C., 6th Gurkha Rifles, Abbottabad, N.W.F.P.; E. O. Shebbeare, Esq., C/o Forest Office, Darjeeling.
<i>Sikkim</i>	..	..	Lt.-Colonel H. W. Tobin, D.S.O., O.B.E., "The Glen," Darjeeling.
<i>Chumbi Valley and Eastern Tibet</i>			Lt.-Colonel J. L. R. Weir, Political Officer, The Residency, Gangtok, Sikkim.
<i>Shillong</i>	..	..	Lieut. J. B. P. Angwin, R.E., Survey of India, Shillong.

II. PHOTOGRAPHIC EXHIBITION.

An Exhibition of Photographs will be held in Simla during September, 1930.

Photographs for exhibition should be sent to the Librarian, mounted and labelled, and should not be smaller than 8 inches by 12 inches.

Photographs for presentation to the Club may be of any size. Views of definite peaks or localities are most welcome, especially if they are clearly described, and arranged to illustrate a typewritten description of a particular journey or locality. These also should be sent to the Librarian, and not to the Secretary or Editor.

III. APPLICATIONS TO VISIT GYANTSE.

It is notified for the information of Members of the Himalayan Club that the proper authority to whom to apply for permission to visit the British Trade Marts at Gyantse or places en route in Tibet is the Political Officer, Sikkim, Gangtok, Sikkim. It is not necessary to apply to the Government of India direct.

IV. EASTERN SECTION NOTICES.

The section of the Himalaya east of Nepal is now designated for purposes of convenience "the Eastern Section." The Calcutta

Sub-Committee will in future be known as the Eastern Section Committee, and the Calcutta Local Secretary becomes *ex officio* the Eastern Section Secretary. This change is merely a question of utility.

It is notified for information that the Local Secretaries at Calcutta and Darjeeling are willing to register the names of those desirous of travelling or climbing in the Eastern Section, and to put them in touch with others whose dates are likely to coincide. Tents, ice-axes, crampons, and other mountaineering equipment are available to members of the Club on loan from the Local Secretary at Darjeeling at a moderate charge.

V. THE MOUNTAIN CLUB OF SOUTH AFRICA.

A letter received from the Honorary Secretary of the Mountain Club of South Africa expresses the hope that "our respective Clubs will keep in touch with one another, and that our relations will become closer by the personal visits of members from time to time." He also assures us that his Club will be pleased to do all it can for any members of the Himalayan Club who may be passing through South Africa. The Club's address is Longmore's Chambers, 115 Longmarket Street, Cape Town.

VI. THE ALPINE JOURNAL.

The following back numbers of *the Alpine Journal* are still required to complete the Himalayan Club Library set : 1—20, 43, 62, 65, 68, 69, 72, 73, 75—78, 83, 85, 90, 101, 104, 107, 110, 116, 129, 130, 134, 136, 143, 148, 159, 162, 170, 188, 190.

VII. THE HIMALAYAN JOURNAL, VOL. III, 1931.

It is hoped to publish the third volume of *The Himalayan Journal* in April 1931. The Honorary Editor, Major Kenneth Mason, will be on leave in England till the beginning of October, and contributions should, if possible, be sent to him there, registered and addressed to him by name, care of The Secretary, Royal Geographical Society, Kensington Gore, London, W. 7. Information required concerning districts or routes in the Himalaya should be addressed direct to the Local Secretaries or Local Correspondents concerned. Other matters requiring immediate attention in India should be addressed to Lieut. J. B. P. Angwin, R.E.,¹ Survey of India, Assistant

Honorary Editor, Himalayan Club, C/o The Director, Eastern Circle, Shillong.

After the first week of October, correspondence for Major Macon should be addressed to him C/o the Assistant Surveyor General, 13, Wood Street, Calcutta.

VIII. PRESENTATIONS OF BOOKS TO THE LIBRARY.

Books presented to the Library, including those for Review, should be addressed to the Librarian, The Himalayan Club, Simla, and not to any official by name.

LIBRARY NOTICES.

BOOKS ADDED TO THE LIBRARY.

(1st February 1929—1st February 1930.)

<i>Author.</i>	<i>Title.</i>	<i>Presented by</i>	<i>Classification.</i>
Abraham, G. D.	First Steps to Climbing.	Purchased.	Mountaineering.
Adair, F. E. S.	A Summer in High Asia.	Do.	Shooting.
Ahmad Shah	Pictures of Tibetan Life.	Do.	Tibet.
Alpine Club	Journals Nos. 21 to 28, 29 to 36, 93 to 100.	Do.	Mountaineering.
Do.	Do. No. 89.	School of Geography, Oxford.	Do.
Do.	Do. Nos. 219, 222, 223.	Col. H. Wood.	Do.
Anderson, C. W.	To the Pindari Glacier.	Purchased.	Central Himalaya.
Austin, H. H.	With Macdonald in Uganda.	Kenneth Mason.	World-wide.
Baker, E. C. Stuart ..	Indian Ducks and their Allies.	Col. R. H. Phillimore.	Birds.
Bairnsfather, P. R. ..	Sport and Nature in the Himalayas.	Purchased.	Shooting.
Ball, John	Peaks, Passes and Glaciers.	Do.	Mountaineering.
Bamber, C. J.	Plants of the Punjab.	W. E. Buchanan.	Botany.
Blatter, E.	Beautiful Flowers of Kashmir.	Purchased.	Do.
Bombay Natural History Society	Journals, Vol. XX, 2, 5.	Col. R. H. Phillimore.	Natural History.
Do.	Do. Vols. XXVI to XXXIII.	Dr. A. M. Heron.	Do.
Boulger, D. C.	Central Asian Questions.	Purchased.	Central Asia.
Boulnois, H. M.	Into Little Tibet.	Do.	Western Himalaya.
Bridges, F. H.	Report on the Shingshal Glaciers, 1908.	Kenneth Mason.	Do.

<i>Author.</i>	<i>Title.</i>	<i>Presented by</i>	<i>Classification.</i>
Brinkman, A.	The Rifle in Cashmere.	Purchased.	Shooting.
Botanical Survey of India ..	Records, Vol. IV, No. 5.	Col. R. H. Phillimore.	Botany.
Brooke, Geoffrey	The Way of a Man with a Horse.	<i>The Statesman.</i>	Sports.
Brown, Percy	Tours in Sikkim.	Purchased.	N. E. Frontier.
Bruce, C. G.	Twenty Years in the Himalayas.	Do.	Western Himalaya.
Burrard, Gerald	Notes on Sporting Rifles.	Do.	Shooting.
Burslem, Rollo	A Peep into Toorkistan.	Purchased.	Western Asia.
Cable and French	Through Jade Gate and Central Asia.	Major A. E. B. Parsons.	Central Asia.
Cadell, I. M.	Diary of a March from Simla to Leh.	Author.	Central Himalaya.
Carey, William	Travel and Adventure in Tibet.	Purchased.	Tibet.
Collett, Sir Henry	Flora Simlensis.	Do.	Botany.
Collie, J. N.	Climbing on the Himalaya.	Do.	Mountaineering.
Colthurst, Ida	Familiar Flowering Trees.	Do.	Botany.
Conway, W. M.	Climbing and Exploration in the Bolivian Andes.	Do.	World-wide.
Do.	Climbing and Exploration in the Karakoram Himalayas.	Do.	Mountaineering.
Do.	Mountain Memories.	Do.	Do.
Cook, F. A.	To the Top of the Continent.	Do.	Do.
Coventry, B. O.	Wild Flowers of Kashmir.	Author.	Botany.
Cox, E. H. M.	Farrer's Last Journey.	Major A. E. B. Parsons.	Do.
Crump, Mrs. A.	A Ride to Leh.	Purchased.	Western Himalaya.

Cumberland, C. S.	..	Sport on the Pamirs.	Do.	Shooting.
Cunningham and Abney	..	The Pioneers of the Alps.	Col. G. J. Ellicombe.	Mountaineering.
Curzon, Lord	..	Tales of Travel.	Purchased.	Western Asia.
Dasent, W. B.	..	The Story of Burnt Njal.	Do.	World-wide.
Davy, Gypsy	..	Himalayan Letters.	Do.	Western Himalaya.
Dewar, Douglas	..	A Bird Calendar for North India.	Do.	Birds.
Do.	..	Himalayan and Kashmiri Birds.	Do.	Do.
Digby, Williams	..	Nepal and India.	Do.	Nepal.
Dodsworth, P. T. L.	..	Mammals found in Simla District.	A. E. Jones.	Natural History.
Dugmore, A. R.	..	The Wonderland of Big Game.	Purchased.	Do.
Duncan, J. E.	..	A Summer Ride through Western Tibet.	Do.	Western Himalaya.
Dunlop, R. H. W.	..	Hunting in the Himalaya.	Do.	Shooting.
Durand, A.	..	The Making of a Frontier.	Col. R. H. Phillimore.	Western Himalaya.
Eckenstein, O.	..	The Karakoram and Kashmir.	Purchased.	Do.
Edwards, W.	..	Reminiscences of a Bengal Civilian.	Do.	India and Himalaya.
Evans, W. H.	..	The Identification of Indian Butterflies.	Author.	Zoology.
Do.	..	The Genus Mycolesia (Lepidoptera).	Do.	Do.
Ferrier, J. P.	..	Caravan Journeys and Wanderings.	Capt. A. E. Armitage.	Western Asia.
Filchner, W.	..	My Central Asian Expedition.	Author.	Tibet.
Do.	..	Om Mane Padme Hum.	Do.	Do.
Finch, G. I.	..	The Making of a Mountaineer.	Purchased.	Mountaineering.
Finn, Frank	..	The Game Birds of India and Asia.	Do.	Birds.
Fitch and Smith	..	Illustrations of the British Flora.	Do.	Botany.
Forbes, H. F. G.	..	The Road from Simla to Shipki.	Do.	Central Himalaya.
Forrester, J. C.	..	A Four-Weeks Tramp through the Himalayas (Pindari Glacier).	Do.	Do.
Freeman, L. R.	..	On the Roof of the Rockies.	Do.	Mountaineering.

BOOKS ADDED TO THE LIBRARY—*contd.*

<i>Author.</i>	<i>Title.</i>	<i>Presented by</i>	<i>Classification.</i>
Freshfield, D. W. ..	Below the Snow-line.	Author.	Mountaineering.
" Ganpat " ..	The Road to Lamaland.	Purchased.	Western Himalaya.
Gardner, A. ..	The Art and Sport of Alpine Photography.	Do.	Mountaineering.
Gerard, Alexander ..	Account of Koonawar. ✓	Do.	Central Himalaya.
Gore, St. John ..	A Tour to the Pindari Glacier.	Do.	Do.
Gregory, J. W. and C. J. ..	In the Alps of Chinese Tibet.	Do.	Eastern Asia.
Grey, Zane ..	Tales of Freshwater Fishing.	<i>The Statesman.</i>	Fishing.
Gribble, F. ..	The Story of Alpine Climbing.	Purchased.	Mountaineering.
Harrop, F. B. ..	Thacker's New Guide to Simla.	Do.	Central Himalaya.
Hasan, Hādi ..	A History of Persian Navigation.	<i>The Statesman.</i>	Western Asia.
Haughton, H. L. ..	Sport and Folklore in the Himalaya.	Purchased.	Shooting.
Hayden and Cosson ..	Sport and Travel in the Highlands of Tibet.	Do.	Tibet.
Heber, A. R. and K. M. ..	In Himalayan Tibet.	Do.	Do.
Hedin, Sven ..	Trans-Himalaya.	Capt. J. W. Rundall.	Do.
Heron, A. M. ..	Geological Results of the Mt. Everest Reconnaissance Expedition.	Author.	Geology.
Hindlip, Lord ..	Sport and Travel in Abyssinia.	Kenneth Mason.	Shooting.
Hooker, J. D. ..	A Sketch of the Flora of British India.	Purchased.	Botany.
Do. ..	Himalayan Journals.	Do.	N. E. Frontier.
Hornby, E. ..	Mountaineering Records.	Do.	Mountaineering.
Howard-Bury, C. K. ..	Mt. Everest: The Reconnaissance.	Do.	Do.
Hume and Oates ..	The Nests and Eggs of Indian Birds.	Do.	Birds.

Hutchinson, H. N.	..	The Story of the Hills.	Do.	Geology.
Huxley, L.	..	Life and Letters of Sir J. D. Hooker.	Do.	Botany.
Irby, A. H.	..	The Diary of a Hunter.	Do.	Western Himalaya.
Jacquemont, V.	..	Letters from India.	Do.	India and Himalaya.
Jenkins, Lady	..	Sport and Travel in both Tibets.	Do.	Tibet.
Jones, A. E.	..	List of Birds found in Simla Hills.	Author.	Birds.
Do.	..	Nightjars of the Simla Hills.	Do.	Do.
Kawaguchi, Shramana Ekai.		Three Years in Tibet.	Purchased.	Tibet.
Kennion, R. L.	..	Sport and Life in the Further Himalaya.	Do.	Shooting.
Kittenberger, K.	..	Big Game Hunting and Collecting.	<i>The Statesman.</i>	Do.
Koenismark, H. Von	..	The Markhor.	Purchased.	Do.
A Lady Pioneer	..	The Indian Alps.	Do.	N. E. Frontier.
Landor, A. H. S.	..	Tibet and Nepal.	Do.	Tibet.
Le Blond, Mrs. A.	..	Adventures on the Roof of the World.	Do.	Mountaineering.
Do.	..	True Tales of Mountain Adventure.	Do.	Do.
Le Coq, A. Von	..	Buried Treasures of Chinese Turkistan.	<i>The Statesman.</i>	Central Asia.
Lefroy, H. Maxwell	..	Indian Insect Life.	W. E. Buchanan.	Natural History.
Lockhart and Woodthorpe	..	The Gilgit-Chitral Mission.	Kenneth Mason.	Western Himalaya.
Luard, John	..	Views in India.	Purchased.	India and Himalaya.
Lydekker, R.	..	The Game Animals of India.	(<i>Unknown.</i>)	Natural History.
Macintyre, D.	..	Hindu Koh.	Purchased.	Shooting.
Mackintosh, L. J.	..	Birds of Darjeeling and India.	Do.	Birds.
MacGillivray, W.	..	Alexander von Humboldt.	Do.	World-wide.
Markham, Fred	..	Shooting in the Himalayas.	Do.	Shooting.
Mason, Kenneth	..	Exploration of the Shaksgam Valley (Records, Survey of India, Volume XXII).	Surveyor-General.	Survey of India.
Do.	..	The Representation of Glaciated Regions on Maps.	Do.	Geology and Geophysics.

BOOKS ADDED TO THE LIBRARY—*contd.*

<i>Author.</i>	<i>Title.</i>	<i>Presented by</i>	<i>Classification.</i>
Masson, Kenneth	Routes in Western Himalaya (2nd Ed.)	Surveyor-General	Western Himalaya.
McCormick, A. D.	An Artist in the Himalayas.	Purchased.	Do.
McCallum, Capt. D.	China to Chelsea.	Messrs. Ernest Benn.	Eastern Asia.
Meinertzhagen, R.	Some Biological Problems.	Author.	Birds.
Do.	Birds collected in Ladak and Sikkim.	Do.	Do.
Merzbacher, G.	The Central Tien Shan Mountains.	Purchased.	Central Asia.
Morden, W. J.	Across Asia's Snows and Deserts.	Author.	Do.
Mountaineer (Wilson)	A Summer Ramble in the Himalayas.	Purchased.	India and Himalaya.
Mumm, A. L.	Five Months in the Himalayas.	Do.	Do.
Mundy, Capt.	Pen and Pencil Sketches.	Do.	Do.
Murray-Aynsley, J. C.	A Three-Months Tour from Simla.	Do.	Central Himalaya.
Neve, Arthur	Picturesque Kashmir	Do.	Western Himalaya.
Neve, Dr. E.	A Crusader in Kashmir.	Author.	Do.
Newall, D. J. F.	The Highlands of India, strategically considered.	Purchased.	India and Himalaya.
Do.	The Highlands of India; field sport and travel.	Do.	Do.
Oates, E. W.	Birds (Fauna of British India).	Do.	Birds.
Old Indian (J. F. Wyman)	From Calcutta to the Snowy Range.	Do.	India and Himalaya.
Olufsen, O.	Through the Unknown Pamirs.	Do.	Central Asia.
Osmaston, B. B.	Bird Life in Gulmarg.	Author.	Birds.
Do.	Bird Notes in Kashmir.	Do.	Do.

Ossendowski, F.	..	Men and Mystery in Asia.	Purchased.	Central Asia.
Palgrave, W. G.	..	Central and Eastern Arabia.	Do.	Western Asia.
Parker, R. N.	..	A Forest Flora for the Punjab.	Do.	Botany.
Petrocokino, A.	..	Cashmere. Three weeks in a houseboat.	Do.	Western Himalaya.
Raeburn, Harold	..	Mountaineering Art.	Do.	Mountaineering.
Raverty, H. G.	..	The Fables of Aesop Al-Hakim.	Punjab Government.	World-wide.
Roosevelt, Theodore and Kermit	..	East of the Sun and West of the Moon.	Purchased.	Central Asia.
Do.	..	Trailing the Giant Panda.	Authors.	Eastern Asia.
Rundall, L. B.	..	The Ibex of the Sha-ping	Purchased.	Natural History.
de Saussures, H. B.	..	Voyages dans les Alpes.	Capt. A. E. Armitage.	World-wide.
Shakespear, H.	..	Wild Sports of India.	Purchased.	Shooting.
"Silver Hackle"	..	Indian Jungle Lore and the Rifle.	Thacker, Spink & Co.	Do.
"Skene Dhu"	..	The Angler in India.	Purchased.	Fishing.
Sleen, W. G. N. van der	..	Four Months' Camping in the Himalaya.	Philip Allan & Co.	Central Himalaya.
Skrine, C. P.	..	Chinese Central Asia.	Author.	Central Asia.
Smythe, F. S.	..	Climbs and Ski Runs.	Do.	Mountaineering.
Starr, L. A.	..	Tales of Tirah and Lesser Tibet.	Purchased.	India and Himalaya.
Stebbing, E. P.	..	Stalks in the Himalaya.	Do.	Shooting.
Stein, Aurel	..	Alexander's Campaign	Author.	Western Himalaya.
Do.	..	On Alexander's Tracks to the Indus	Do.	Do.
Do.	..	Ancient Geography of Kasmir.	Surveyor-General.	Do.
Do.	..	An Archæological Tour with the Buner Field Force.	Punjab Government.	Do.
Do.	..	A Chinese Expedition.	Author.	Central Asia.
Do.	..	Innermost Asia : Its Geography as a Factor in History.	Do.	Do.
Do.	..	Marco Polo's Account of a Mongol Inroad.	Do.	Western Himalaya.

BOOKS ADDED TO THE LIBRARY—*concl'd.*

<i>Author.</i>	<i>Title.</i>	<i>Presented by</i>	<i>Classification.</i>
Stockley, C. H.	Big Game Shooting in the Indian Empire.	Author.	Shooting.
Do.	Shikar.	<i>The Statesman.</i>	Do.
Stone, S. J.	In and Beyond the Himalayas.	Purchased.	Western Himalaya.
Swinburne, T. R.	A Holiday in the Happy Valley.	Do.	Do.
Sykes, E. and P.	Through Deserts and Oases of Central Asia.	Do.	Central Asia.
Taverner, E.	Trout-Fishing from all Angles.	<i>The Statesman.</i>	Fishing.
Taylor, Neville	Ibex Shooting on the Himalayas.	Purchased.	Shooting.
Temple, R.	Journals kept in Hyderabad, etc.	Do.	India and Himalaya.
Thomas, H. S.	The Rod in India.	Capt. J. W. Rundall.	Fishing.
Turner, Samuel	My Climbing Adventures in Four Continents.	Purchased.	Mountaineering.
Tyacke, R.	In Quest of Game in Kulu.	Do.	Shooting.
Do.	Fish and Fishing in Kulu.	Do.	Fishing.
Wall, F.	Poisonous Terrestrial Snakes.	Do.	Natural History.
Ward, A. E.	The Mammals and Birds of Kashmir.	Do.	Do.
Ward, F. Kingdon	The Mystery Rivers of Tibet.	Do.	N. E. Frontier.
Do.	The Riddle of the Tsangpo Gorges.	Author.	Tibet.
Do.	The Romance of Plant Hunting.	Purchased.	Eastern Asia.
Ward, Rowland	Records of Big Game.	Do.	Shooting.
Do.	The Sportsman's Handbook.	Authors.	Do.
Warner, Langdon	The Long Old Road in China.	Purchased.	Eastern Asia.
Whistler, Hugh	In the High Himalayas.	Do.	Central Himalaya.

Do.	..	..	Note on the Birds of Spiti.	Author.	Birds.
Do.	..	..	Birds of the Kangra District.	Do.	Do.
Do.	..	..	Birds of Lahul.	Do.	Do.
Do.	..	..	Birds of Jhang District.	Do.	Do.
Do.	..	..	Birds of Kulu.	Do.	Do.
Do.	..	..	Some Birds observed at Fagoo.	Do.	Do.
Do.	..	..	Contribution to Ornithology of Kashmir.	Do.	Do.
Do.	..	..	Further Notes on Birds about Simla.	Do.	Do.
White, G. F.	..	..	Views, chiefly in the Himalayas.	Purchased.	India and Himalaya.
Whympers, E.	..	..	Travels amongst the Great Andes of the Equator.	Capt. A. E. Armitage.	Mountaineering.
Wilson, Alban	..	..	Trout-Fishing in Kashmir.	Purchased.	Fishing.
Wilson, Andrew	..	..	The Abode of Snow.	Capt. J. W. Rundall.	India and Himalaya.
Wilson, Claude	..	..	Mountaineering.	Purchased.	Mountaineering.
Wolff, Rev. J.	..	..	Bokhara.	Do.	Western Asia.
Workman, F. B. and W. H.	..	..	Peaks and Glaciers of the Nun Kun.	Do.	Mountaineering.
Do.	..	..	Two Summers in the Ice-Wilds of the Eastern Karakoram.	Capt. J. W. Rundall.	Do.
Young, G. Winthrop	..	..	On High Hills.	Mrs. L. A. Pattinson.	Do.
Younghusband, F.	..	..	The Heart of Nature.	Purchased.	India and Himalaya.
Do.	..	..	Pekin to Lhasa.	Capt. J. W. Rundall.	....
Do.	..	..	Wonders of the Himalaya.	Do.	Western Himalaya.

The following photographs have been presented to the Club mostly from the exhibition of 1928.

10	photographs of Hunza and Chinese Pamirs	C. P. SKRINE.
14	„ „ Switzerland	.. N. A. TOMBAZI.
10	„ „ Sikkim ..	.. N. A. TOMBAZI.
4	„ „ Muztagh ..	.. KENNETH MASON.
2	„ „ Dharmsala ..	.. E. ST. J. BIRNIE.
6	„ „ Kulu and Leh	.. I. M. CADELL.
1	water colour painting, Trisul	.. MISS G. E. BENHAM.

The following periodicals are now being received in the Library, mostly in exchange with the Himalayan Journal.

The Alpine Journal.

The American Alpine Journal.

The Annual of the Mountain Club of South Africa.

Asiatica.

Bolletino della Reale Societa Geografica Italiana.

Bulletin of Appalachian Mountain Club.

Cambridge Mountaineering.

L'Echo des Alpes.

The Geographical Journal.

Geographical Review (New York).

La Géographie.

Geography.

India.

The Journal of the Bombay Natural History Society.

(Journal of the Japanese Alpine Club) Sangaku.

Journal of the United Service Institution of India.

Ladies' Alpine Club Year Book.

Quarterly Journal of the Geological, Mining and Metallurgical Society of India.

La Montagne.

Revue de Géographie Alpine (Grenoble).

Scottish Geographical Magazine.

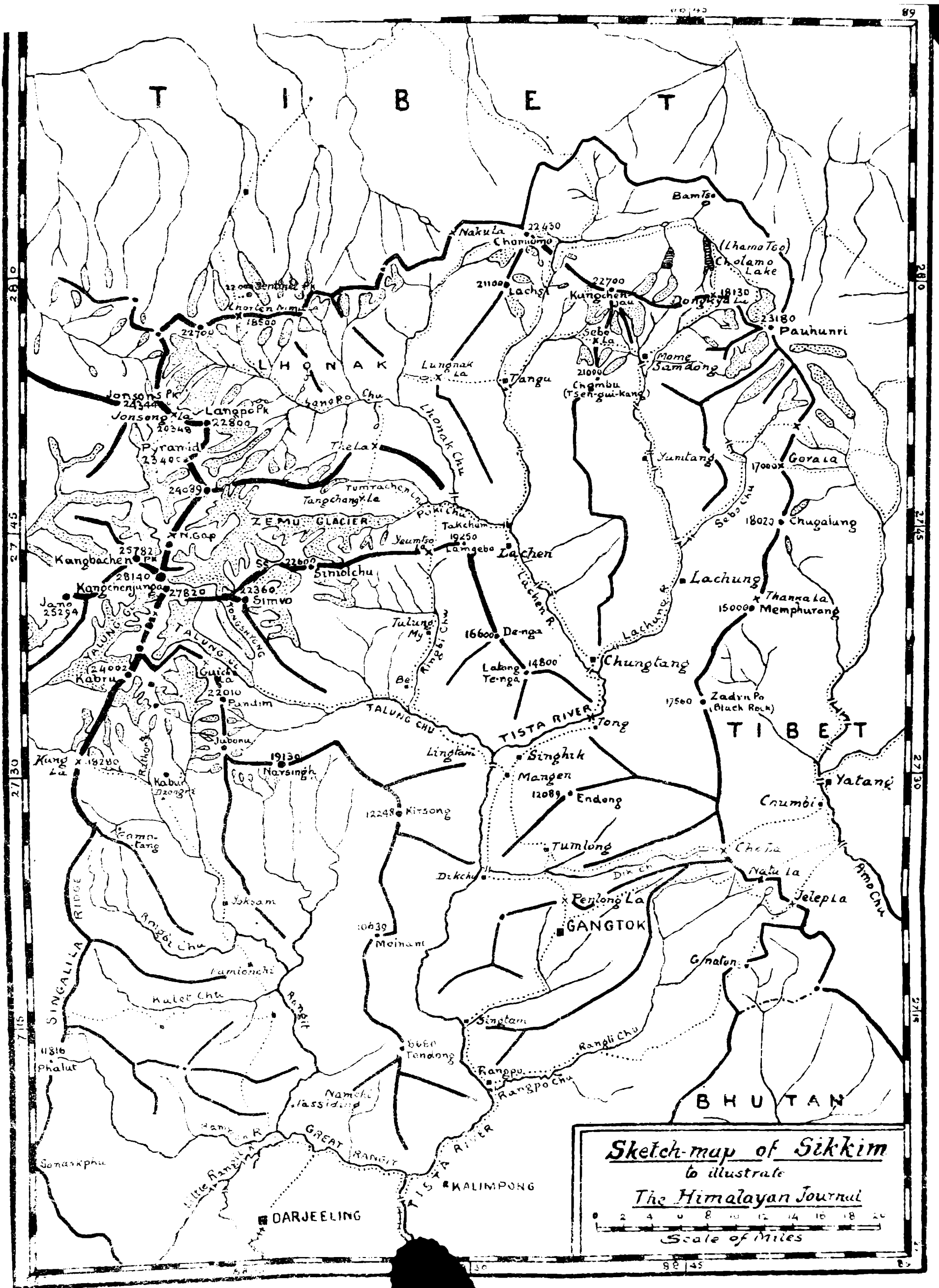
Scottish Mountaineering Club Journal.

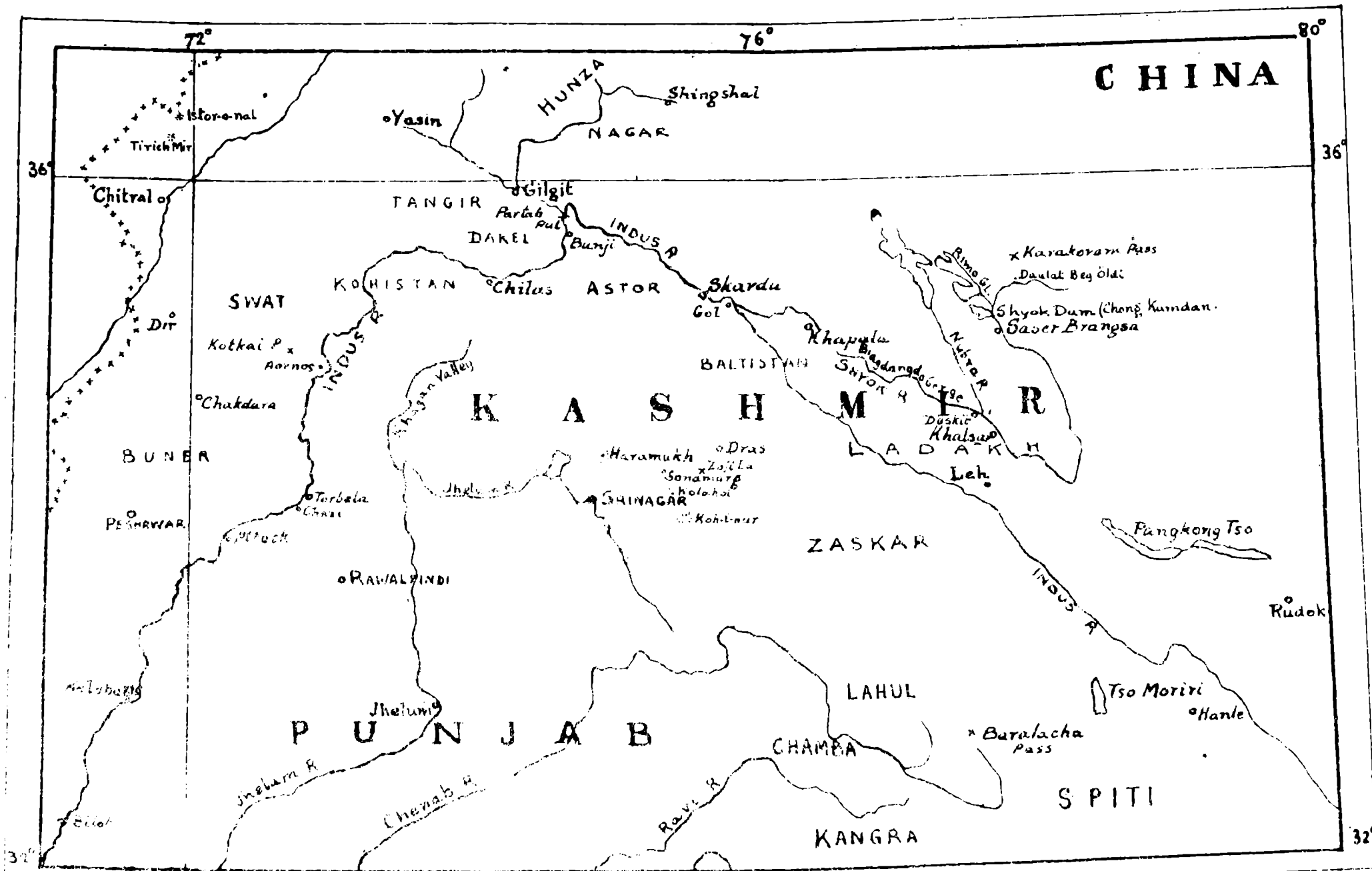
Ski Club of India Annual.

Le Vie d' Italia.

Yorkshire Ramblers Club Journal.

Zeitschrift der Gesellschaft für Erdkunde zu Berlin.



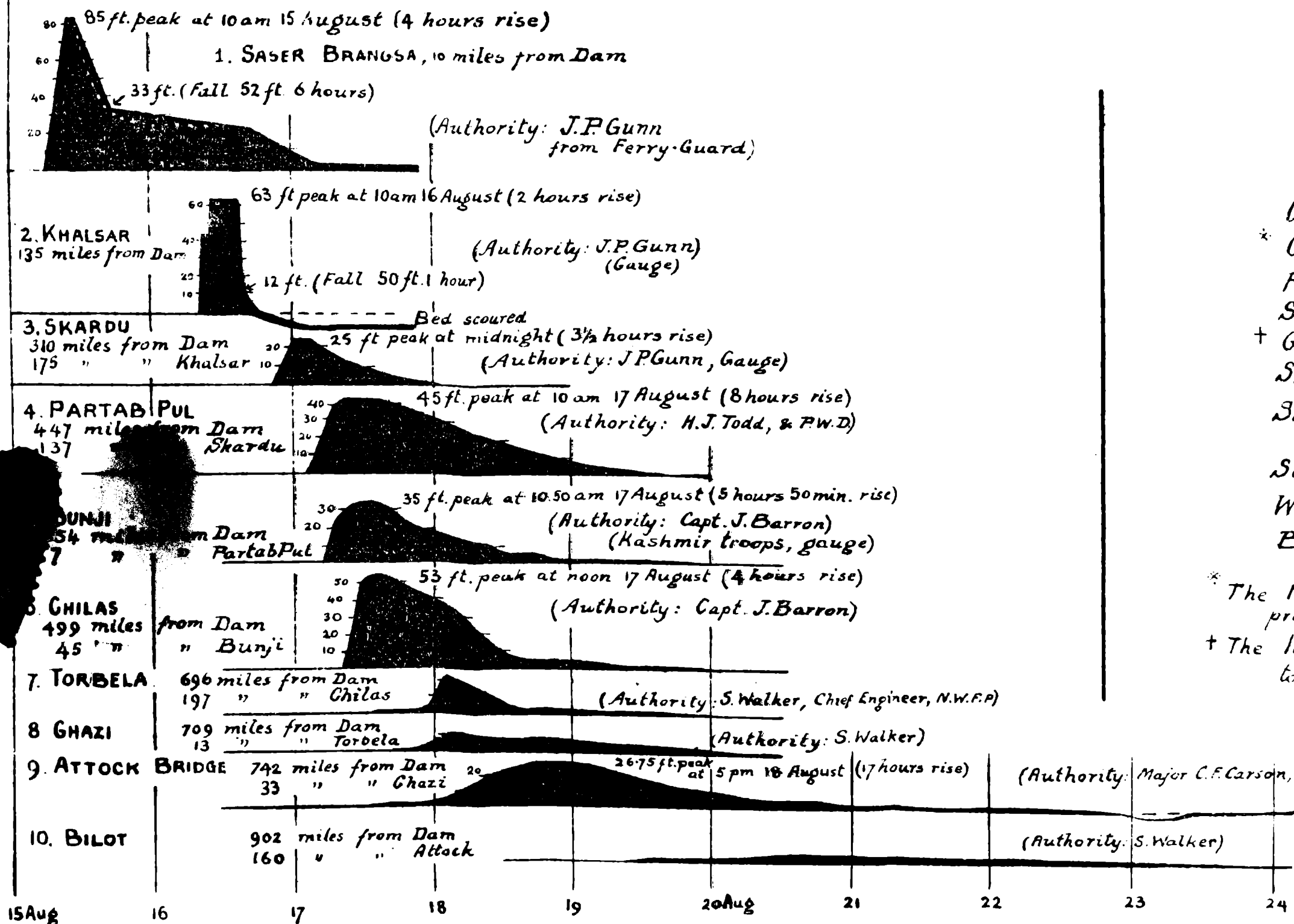


SKETCH-MAP OF NORTHERN INDIA

Scale 1:4,000,000

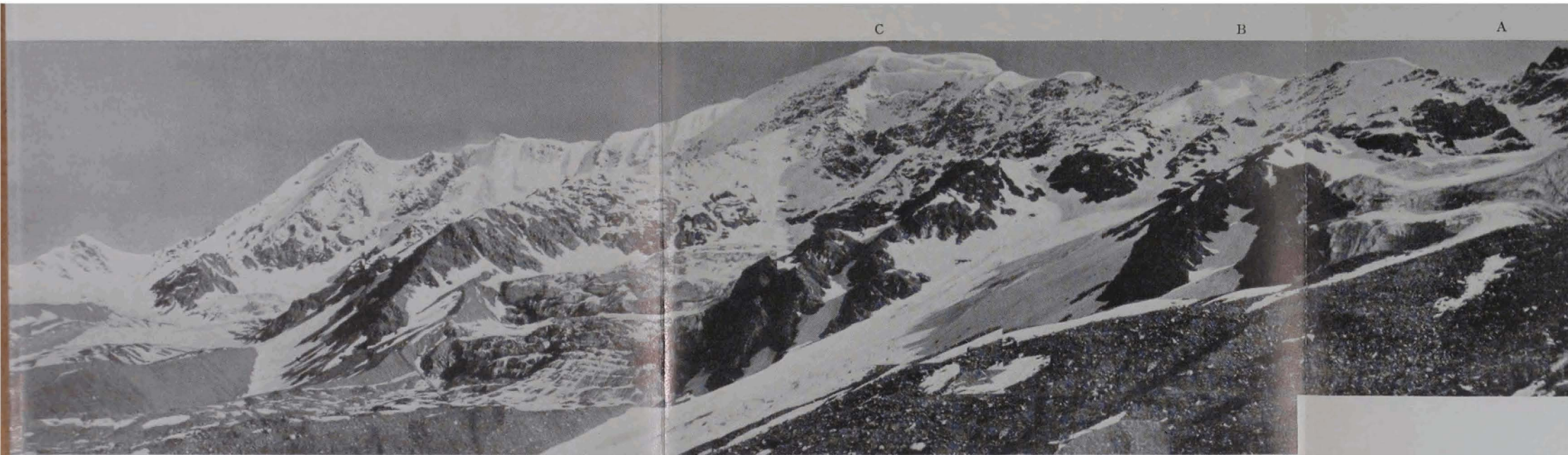


↓ Chong Kumdan Dam broke first at 5am 15 August



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SHYOK FLOOD WAVE-CURVES: SASER BRANGSA TO BILOT



2. *Bandarpunch, 20,720 feet, from the south, July 1937*

A. Snow-gully climbed to ridge; camp on ridge

B. Point on ridge reached

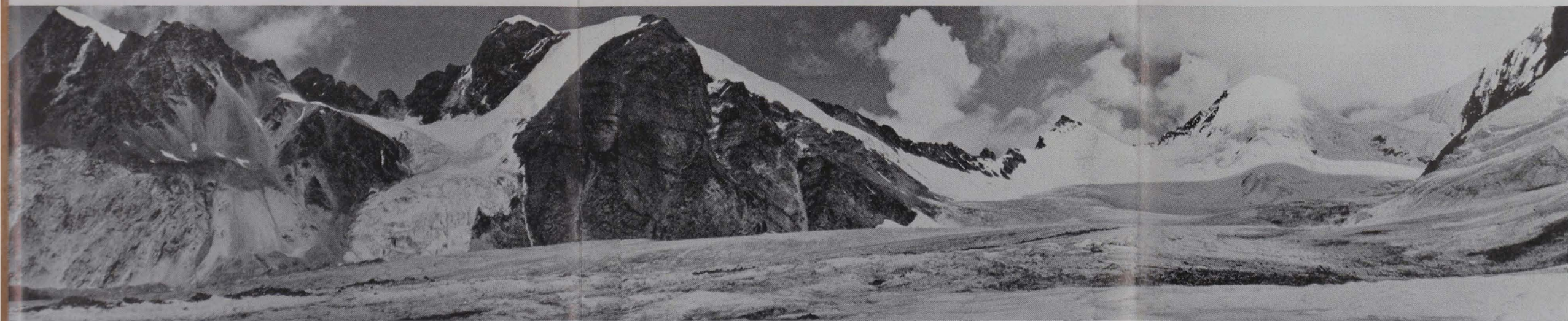
C. Summit, 20,720 feet

C

19,801

D

20,805



Seta Bamak

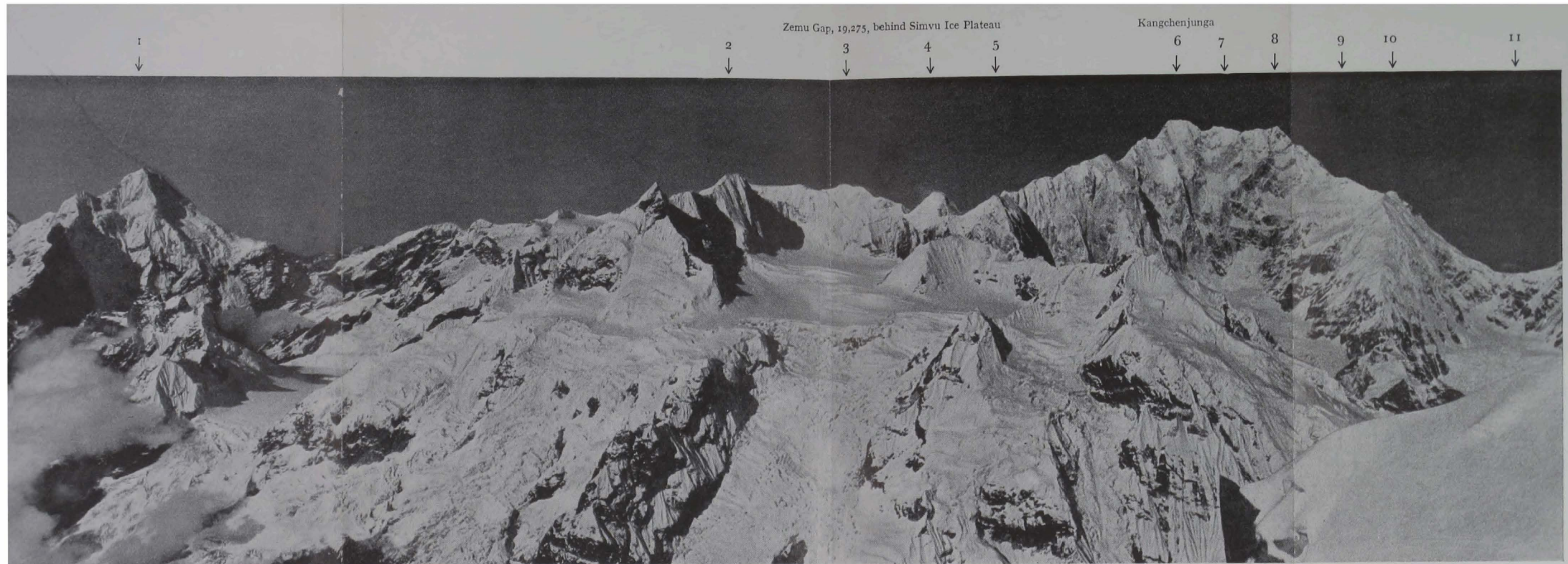
3. *View from north-east to south-east from the head of the Chaturangi Bamak, about 18,650 feet, August 1937*

A. Head of Kamlindi Bamak

B. Pass crossed behind black mountain

C. Shipton's pass, 1934

D. Birnie's col, 1931



Upper ice-slopes of Passanram glacier

3. *View westwards and south-westwards from the north-west shoulder, Point 6,470 m., of Siniolchu*

highest, 22,390. 3. Kabru, 24,000. 4. Talung peak, 23,082. 5. Simvu North and North-east peaks. 6. 27,888. 7. South ridge. 8. Summit, 28,146. 9. North ridge. 10. North-east spur. 11. Saddle, 22,623.